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ESC

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REMEDIAL ACTION REPORT

DUTCHBOY SITE
CHICAGO, ILLINOIS

VOLUME 1 OF 2

REPORT, FIGURES, AND TABLES

PREPARED

BY

ENVIRONMENTAL STRATEGIES CORPORATION

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Acronym List

ACM	asbestos-containing material
BETX	benzene, toluene, ethylbenzene, and xylenes
bgs	below ground surface
CS	confirmation soil sample unpaved area
CSP	paved area confirmation sample
CPU	paved area untreated soil stockpile sample
CPT	paved area treated soil stockpile sample
DRO	diesel range organics
EOC	Extent of Contamination
Environ	Environ International Corporation
EOC	extent of contamination
EPA	U.S. Environmental Protection Agency
EP	extraction procedure
ESC	Environmental Strategies Corporation
E&E	Ecology and Environment, Inc.
GRO	gasoline range organics
Harza	Harza Environmental Services, Inc.
IAC	Illinois Administrative Code
IDPH	Illinois Department of Public Health
IEPA	Illinois Environmental Protection Agency
µg/kg	microgram per kilogram
$\mu g/m^3$	micrograms per cubic meter
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
NBAAQS	National Ambient Air Quality Standard
NL	NL Industries, Inc.
OSC	on-scene coordinator
PAH	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
SAIC	Science Applications International Corporation
Simon	Simon Hydro-Search, Inc.
SPU	unpaved area untreated soil stockpile sample
SPT	unpaved area treated soil stockpile sample
SRA	Supplemental Remedial Action
SVOC	semivolatile organic compound
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristic Leaching Procedure
TSP	Total Suspended Particles
Toxcon	Toxcon Engineering Company, Inc.
UAO	Unilateral Administrative Order
VOC	volatile organic compound
XRF	X-ray fluorescence

1.0 Introduction

1.1 General

Environmental Strategies Corporation (ESC) on behalf of NL Industries, Inc. (NL) has prepared this Remedial Action (RA) Report for the Dutch Boy site in Chicago, Cook County, Illinois. The purpose of the Remedial Action was to mitigate and manage risks posed by lead present in shallow soil at the site. The objective of the Remedial Action was to reduce the threat to human health and the environment posed by surface soil containing concentrations of lead above the United States Environmental Protection Agency (EPA) established risk-based cleanup goal for lead of 1,400 milligrams per kilogram (mg/kg).

The Remedial Design/Remedial Action (RD/RA) Work Plan (Work Plan) was submitted in to the EPA on March 9, 1999, accordance with the terms of the March 26, 1998, Unilateral Administrative Order (UAO) issued to NL by the EPA. Specifically, the RD/RA was designed to implement the EPA-approved alternative to abate the risks associated with lead-containing soil at the site. The approved alternative was selected in the Risk Management Plan prepared by Environ International Corporation (Environ), dated December 1998. This Work Plan was prepared in accordance with guidance developed by the EPA Office of Emergency and Remedial Response. The EPA approved the RD/RA with modifications on April 23, 1999. ESC submitted RD/RA amended pages to the EPA on May 6, 1999.

In addition, ESC prepared a Supplemental Remedial Action (SRA) Work Plan for the former Dutch Boy site and submitted the plan to the city of Chicago on July 1, 1999 (Revised on August 8, 1999). The objective of the SRA was to reduce the threat to human health and the environment posed by soil beneath part of the paved area at the site containing concentrations of lead above the EPA established risk-based cleanup goal of 1,400 mg/kg. The SRA was conducted in accordance with the June 9, 1999, Consent Decree between the City of Chicago and NL. The SRA replaced the RD/RA Work Plan that included the placement of asphalt pavement over part of the paved area of the site.

1.2 Summary of the Remedial Action Plan

The Risk Management Plan for the Dutch Boy Site (December 1998) detailed options for mitigating the risks associated with lead-containing soil at the site. The plan considered various alternatives to reduce the risks, compared costs and protectiveness of each alternative, and recommended an alternative to be implemented that was cost-effective and protective of human health and the environment. Alternative 4 from the Risk Management Plan was selected for the Remedial Action. The Remedial Action selected for the Dutch Boy site consists of the following components:

- Lead-containing soil excavation and sampling
- Soil stabilization
- Offsite disposal
- Underground storage tank closures
- Debris pile removal and offsite disposal
- Asphalt-pavement cap placement
- Implementation of maintenance program

This alternative consisted of excavation, treatment, and disposal of all soil in the unpaved areas of the site containing total lead concentrations greater than the EPA's risk-based cleanup criteria of 1,400 mg/kg. Approximately 5,000 cubic yards of lead-containing soils was to be excavated and treated onsite by stabilization to eliminate the characteristic of toxicity (nonhazardous). The treated soil was to be disposed of offsite at a landfill permitted under Subtitle D of the Resource Conservation and Recovery Act (RCRA). The alternative achieves the objective of the Remedial Action by eliminating the potential for direct contact and ingestion of lead in unpaved, onsite soils.

Two construction debris piles were present on the southern and southwestern portions of the site. The piles were estimated to contain approximately 850 cubic yards of material. Each pile contains debris from the post-1980 demolition activities. The 800 cubic yard pile was be transported offsite for disposal as demolition debris. The 50 cubic yard pile consists of brick and mortar and was to remain onsite.

Nine underground storage tanks were present at the site. This alternative includes the closure of the tanks by removal during implementation of the Remedial Action. The storage tanks were located under the concrete slab on the west-central portion of the site and have an aggregate capacity of approximately 150,000 gallons. Liquids, solids, and sludges contained in the tanks were previously removed by the Illinois Environmental Protection Agency (IEPA).

The paved areas of the site consist primarily of concrete slabs from former site buildings with some asphalt-paved areas. The RD/RA Work Plan alternative included the repair of damaged onsite concrete surfaces. A 2–3 inch thick asphalt-pavement cap was to be placed over areas of the existing concrete surface which are not intact and provided a potential direct-contact exposure pathway to lead-containing soil; and, a long-term maintenance program was to be developed and implemented for the asphalt cap. However, this RD/RA alternative plan was replaced by the SRA Work Plan that proposed to excavate lead-containing soils soil beneath part of the paved area at the site containing concentrations of lead above the EPA established risk-based cleanup goal of 1,400 mg/kg and treat onsite by stabilization to eliminate the characteristic of toxicity (nonhazardous). The treated soil was to be disposed of offsite at a landfill permitted under Subtitle D of the RCRA The SRA was conducted in accordance with the June 9, 1999, Consent Decree between the City of Chicago and NL.

The Supplemental Remedial Action for the Dutch Boy site consisted of the following components:

- Removing concrete slabs and disposing offsite
- Excavating soil containing lead greater than 1,400 mg/kg
- Stabilizing soils onsite to render them nonhazardous
- Disposing of soil offsite
- Backfilling and compaction of excavated areas

The SRA proposed removing, cleaning, and stockpiling onsite approximately 3,250 square yards of concrete and excavating, treating onsite by stabilization to eliminate the toxicity characteristics (nonhazardous) offsite of approximately 1,150 cubic yards of lead-containing soil. The treated soil was to be disposed of offsite at a landfill permitted under Subtitle D of the RCRA.

The paved areas of the site to be removed appeared to be concrete slabs from former site buildings. Portions of the concrete surfaces were cracked and in disrepair.

2.0 Site Description

2.1 Site Location and Description

The Dutch Boy site facility is located at 12000 to 12054 South Peoria Street and 901 to 935 West 120th Street, Cook County, Chicago, Illinois (Figure 1). The site comprises 5.2 acres and is situated in a primarily industrial area. It is bound to the north by West 120th Street, to the east by South Peoria Street, to the south by rail lines of the Illinois Central Gulf Railroad, and to the west by an empty lot.

There are no buildings standing at the site although concrete building slab foundations cover much of the site. Approximately 75-percent of the site is under concrete cover and the remaining 25 percent is soil covered. The unpaved areas run in strips from north to south along the western edge of the property and extend to the southeast corner of the site. The unpaved areas likely were associated with the former railroad spurs that crossed the property.

2.2 Site History

From 1906 to 1980, the site was used to manufacture and refine white lead (i.e., lead carbonate) and lead oxide for lead-based paints and other lead-related products. No manufacturing has been conducted at the site since 1980. Based on previous reviews of Sanborn maps and historical aerial photographs, building demolition occurred at the site from the mid-1980s through 1996.

Various industrial activities have been conducted in the immediate vicinity of the site, including an aluminum foundry, metal machining shops, vehicle and heavy equipment maintenance and storage, junkyards, coal yards, and other metal treatment, forging finishing, and pickling operations. However, most of the properties surrounding the site are currently abandoned or vacant, it is likely that historic activities at these facilities have influenced lead concentrations in soils in the vicinity of the Dutch Boy site. \

2.3 Topography

The site surface is generally flat. Most of the site is either at ground surface or elevated approximately four feet to loading-dock level. The ground elevation at the site is approximately 610 feet above mean sea level (United States Geological Survey 7.5' Blue Island, Illinois

Quadrangle, 1993). Area topography generally slopes to the south towards the Little Calumet River located over 1 mile south of the site.

2.4..Summary of Previous Investigations

Environmental investigations began at the site in 1986 with an IEPA-conducted removal action. This removal was done in three phases. IEPA removed and disposed of surficial solids, both suspected and known to contain lead and asbestos during Phase I in June 1986.

IEPA sampled, analyzed and disposed of liquids, solids and sludges contained in all aboveground and underground storage tanks during Phase II in November 1986. IEPA also removed and disposed of all existing process and production equipment, baghouses, mixing tanks, screw conveyors, hoppers, masonry rubble, asbestos, and debris located in and around the building. The freestanding walls of the buildings were demolished during Phase II. IEPA assessed the structural integrity of the underground storage tanks and concluded that they were structurally sound and did not leak during Phase III in 1987. IEPA also sampled and analyzed soil for lead. Results indicated that 130 cubic yards of soil on and adjacent to the site contained Extraction Procedure (EP) toxicity extract lead concentrations greater than 5 milligrams per liter (mg/l) and approximately 140 cubic yards of soil contained greater than 1 percent lead. An EP toxicity extract lead concentration equal to or greater than 5 mg/l was defined as a hazardous waste under the RCRA regulations in effect at that time. The soil was not removed.

In June 1987, Toxcon Engineering Company, Inc. (Toxcon) conducted a field investigation at the site on behalf of NL. Samples were collected at 34 locations onsite and in the parkway across the street from the site. A soil sample taken from the northeast portion of the site contained a total lead concentration of 11,400 mg/kg. A second sample taken from the west side of the site contained 50,000 mg/kg of total lead. This second also had an EP toxicity extract lead concentration of 41 mg/l. In addition, analysis of a third sample taken from the parkway northeast of the site had an EP toxicity lead extract concentration of 4.6 mg/l. Based on these sample results and discussions with IEPA, Toxcon conducted additional field sampling in February 1988 and concluded that one onsite area and two offsite areas contained EP toxicity extract lead concentrations greater than 5 mg/l.

In 1991, EPA's contractor, Ecology and Environment, Inc. (E & E) conducted a reconnaissance at the Dutch Boy site. E & E observed small piles of general household and construction refuse scattered over the site. Since abandoned building structures containing potentially hazardous substances and lead-containing soils surrounding these structures were still present, E & E concluded that release of hazardous substances to the air was still a potential threat to human health. E & E recommended that the site be secured to prevent access by the public and that samples of the building structures and soils be taken to determine whether the release of hazardous substances from the site posed a potential threat to the community.

On August 10, 1993, EPA, IEPA and E & E conducted a site assessment of the Dutch Boy property. No soil piles or exposed soils were identified at the site and no soil samples were collected. On August 25 and 26, 1993, Simon Hydro-Search, Inc. (Simon) conducted an environmental assessment of the site on behalf of NL. Eleven soil samples were collected from seven onsite locations. In samples from the area of the loading dock and railroad spur on the west side of the site, total lead concentrations as high as 45,700 mg/kg and Toxicity Characteristic Leaching Procedure (TCLP) lead extract concentrations as high as 694 mg/l were measured. In the road outside the northeast corner of the site, a total lead concentration of 19,200 mg/kg and a TCLP lead extract concentration of 98.4 mg/l were measured in a sample. A TCLP extract lead concentrations equal to or greater than 5 mg/l is defined as a RCRA hazardous waste (hazardous waste code D008).

On May 10, 1994, Harza Environmental Services, Inc. (Harza) conducted a site investigation on behalf of the City of Chicago. Harza collected and analyzed 13 wipe samples and 13 scrape samples from the 3-story mill building at the site. Seven of the 13 wipe samples and 8 of the 13 scrape samples met the Illinois Department of Public Health (IDPH) definition of a lead-bearing substance. Six soil samples collected from depths between 6 and 15 feet below ground surface (bgs) were analyzed for TCLP lead. One other soil sample was collected at a depth of 1.0 to 2.5 feet bgs. All soil samples had TCLP lead concentrations at or below the 5.0 mg/l RCRA concentration for hazardous waste.

On June 8, 1995, an EPA on-scene coordinator (OSC) and staff from E & E and Harza conducted another site assessment. Six soil samples were collected and analyzed for lead. Total lead was detected in onsite soils at concentrations ranging from 1,540 mg/kg to 31,700 mg/kg. A total lead concentration of 21,200 mg/kg was reported in a sample collected from the east side of the building structure near a fire hydrant. A total lead concentration of 31,700 mg/kg was reported in another sample collected from the east side of the northernmost loading dock on the west side of the site. This sample also had a TCLP lead extract concentration of 351mg/l. In an August 25, 1995

Site Assessment Report, E & E concluded that the site should be secured and an extent of contamination study should be conducted to determine the extent of lead-containing soil at the site.

In February 1996, EPA's contractor, Science Applications International Corporation (SAIC), reviewed the available reports on the site and assessed the likelihood of a potential release of lead from the historic manufacturing processes. SAIC calculated that approximately 166 tons of lead was released into the air between 1906 and 1980 from the historic manufacturing activities. Assuming that each of the manufacturing processes site had a short stack, low exit velocity, and low temperature, SAIC predicted that most of the emissions would have settled out within several hundred feet.

In March 1996, EPA prepared an interim final risk assessment for the site. The risk assessment assumed that the site would be used for an occupational scenario and that it would not be frequented by small children. Based on these assumptions, EPA calculated a risk-based clean-up goal of 1,400 mg/kg as the average concentration of lead in soil, which would allow for risks within an acceptable range. In addition, the risk assessment recommended that any hot spots which are significantly higher than the 1,400 mg/kg be remediated even if, when averaged, they contribute to an acceptable range of risk.

In 1997 an Extent of Contamination (EOC) survey was conducted for the site by Environ Corporation. The primary objective of the EOC survey was to evaluate the vertical and horizontal extent of lead in soil at the site and in its vicinity. Over 350 samples from 151 locations were collected and analyzed. The extent of onsite soils containing lead at concentrations greater than the 1,400 mg/kg risk-based cleanup criteria was found to be generally limited to the western, unpaved portions of the site. The areas most affected are the former rail spurs leading to the loading dock in the northwestern portion of the site. Surface soil (i.e., 0.0 to 0.2 feet below ground surface) lead concentrations in the rail spur area range from 5,000 to 10,000 mg/kg.

Selected soil samples also were analyzed for several other parameters (e.g., asbestos, petroleum hydrocarbons, and volatile organic compounds) to evaluate their impact on remedial technologies for the lead-containing soil. Diesel-related petroleum hydrocarbons were identified in soil samples collected near the loading dock in the northwest portion of the site. The petroleum-hydrocarbon impacted soil is confined to the immediate vicinity of the underground storage tanks. Based on the concentrations of hydrocarbons detected at the site, it is unlikely that they will affect the technology selected to address lead-containing soil.

3.0 Description of Remedial Action

The following information summarizes the Remedial Action work performed at the Dutch Boy site between May 6, 1999 to October 21, 1999.

Onsite Activities - Unpaved Area

- Excavated 100% of the onsite unpaved surface area with lead impacted soil.
- Excavated and stockpiled 7,848 tons of lead contaminated soil.
- Removed the sediment pile from under the former mill building (sample location SS-57).
- Collected a total of 51 confirmation soil (CS) samples including an additional 6 duplicates and 5 equipment blanks and analyzed for total lead.
- Total lead concentrations for all final CS samples were detected at concentrations below the cleanup criteria of 1,400 milligrams per kilogram (mg/kg).
- Collected 69 soil samples including 7 duplicates and 7 equipment blanks and analyzed for TCLP lead from untreated soil stockpiles (SPU).
- TCLP results for SPU samples collected from 7 stockpiles of untreated soil were less than the regulatory level of 5 milligrams per liter (mg/l) for lead, therefore, 612 tons of soils did not require treatment.
- TCLP results for SPU samples collected from the other 62 stockpiles of untreated soil ranged from 4.9 to 522 mg/l.
- Treated 7,236 tons of lead impacted soils using 332 tons of reagent (3.6 percent by weight).
- Collected 14 soil samples including 2 duplicate and 3 equipment blanks and analyzed for TCLP lead from treated soil stockpiles (SPT).
- TCLP results for SPT samples collected from 14 stockpiles of treated soil indicated all stockpiles with lead not detected or below the regulatory level of 5.0 mg/l, indicating the soil could be disposed of as a non-hazardous waste.
- Transported and disposed of 8,180 tons that consisted of 7,236 tons of treated soil, 264 tons of reagent, and 612 tons of untreated soil.
- Pumped and disposed of 113,500-gallons of storm water from the site.
- Removed and disposed of offsite of nine underground storage tanks, all of which were totally encased in concrete and flowable fill (low psi concrete).
- Additional excavated soil was generated from the removal of the nine underground storage tanks where soil was excavated from a depth of 4 feet below ground surface (bgs) to a depth of 9 feet bgs. A hard dense clay as encountered at a depth from 9 to 11 feet bgs.
- Removed and disposed of 234 cubic yards of concrete from the underground storage tank area
- Collected a total of 17 confirmation soil samples from around the underground storage tanks at a depth of nine feet bgs including 2 duplicates and 2 equipment blanks and analyzed for total lead.
- Total lead concentrations for all underground storage tank CS samples were detected at concentrations below the cleanup criteria of 1,400 mg/kg with the exception of one sample with total lead detected at a concentration of 1,700 mg/kg, collected at a depth of 9 feet bgs.

- Collected from around the two 10,000-gallon fuel oil and mineral spirits underground storage tanks at a depth of nine feet bgs a total of 8 CS samples, including 1 duplicate, and analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).
- Collected from around the two 10,000-gallon linseed oil and the three 30,000-gallon linseed oil and mineral spirits underground storage tanks at a depth of nine feet bgs a total of 8 CS samples including 1 duplicate and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs).
- Collected from the piping area near the loading dock at a depth of nine feet bgs a total of 1 CS sample and analyzed for BTEX and PAHs.
- Detected concentrations of various VOCs, SVOCs, BTEX, and PAHs were below the Illinois Tiered Approach to Corrective Action Objectives (TACO) Tier I soil standards for industrial-commercial exposure via ingestion.
- Collected three samples of the flowable fill and analyzed for VOCs, PAHs, total lead and TCLP lead. Analytical results for total lead concentrations between 340 to 486 mg/kg and no detectable leachable lead. The flowable fill was used as backfill from the bottom of the underground storage tank excavations to no higher than a depth of 4 feet bgs.
- Placed and compacted 8,180 cubic yards of backfill.
- Seeded and mulched 0.6 acres.
- Treated 40 cubic yards of debris that potentially contained lead impacted soil.
- Removed and disposed of offsite 350 cubic yards from the asbestos-containing debris piles that consisted of 275 cubic yards of ACM, 45 cubic yards of asphalt, brick, and concrete, and 30 cubic yards of rebar.
- Collected a total of 56 air samples from air monitoring equipment located at the four corners of the site during 12 24-hour periods and analyzed the samples for lead and particulate mass.
- Analysis of the air samples indicates that lead mass has been detected at concentrations less than the National Ambient Air Quality Standard (NAAQS) 1.5 micrograms per cubic meter ($\mu g/m^3$) for lead with the exception of one sample collected on July 30, 1999.
- Analysis of the air samples indicates that particulate mass has been detected at concentrations less than the NAAQS of 150 $\mu g/m^3$ for particles less than 10 microns, with the exception of one sample collected on July 22, 1999.

3.2 Offsite Activities - Parkway Soils

- Excavated 100% of the parkway area with lead impacted soil.
- Excavated and stockpiled 1,047 tons (approximately 775 cubic yards) of lead impacted soil.
- Additional excavated soil was generated from areas proposed for an excavation of between 3 to 12-inches bgs that required excavation to a depth of 22 to 27 inches bgs based on CS samples that exceeded 1,400 mg/kg and from the parkway area at the southeast side of the site that had not been designated for excavation based on the original investigation data.
- Collected a total of 10 confirmation soil samples including 2 duplicates and 1 equipment blank and analyzed for total lead.
- Total lead concentrations for all final CS samples were detected at concentrations below the cleanup criteria of 1,400 mg/kg.
- Collected 6 soil samples including 1 duplicate and 1 equipment blanks and analyzed for TCLP lead from untreated soil stockpiles (SPU).

- TCLP results for SPU samples collected from 3 stockpiles of untreated soil were less than the regulatory level of 5 mg/l for lead, therefore, 409 tons of soils did not require treatment.
- TCLP results for SPU samples collected from the other 3 stockpiles of untreated soil ranged from 6.6 to 31.2 mg/l.
- Treated 637 tons of lead impacted soils using 20 tons of reagent (3.1 percent by weight).
- Collected 2 soil samples and analyzed for TCLP lead from treated soil stockpiles (SPT).
- TCLP results for SPT samples collected from 2 stockpiles of treated soil indicated all stockpiles with lead not detected or below the regulatory level of 5.0 mg/l, indicating the soil could be disposed of as a non-hazardous waste.
- Transported and disposed of 1,066 tons that consisted of 637 tons of treated soil, 20 tons of reagent, and 409 tons of untreated soil.
- Placed and compacted 700 cubic yards of backfill.
- Seeded and mulched 0.2 acres.

Onsite Activities - Paved Area Soils

- Removed, cleaned and stockpiled 3,232 square yards of concrete.
- Excavated 100% of the paved area designated in the SRA Work Plan with lead impacted soil.
- Excavated 3,074 tons (approximately 2,277 cubic yards) of lead impacted soil.
- Collected a total of 46 confirmation soil samples including 5 duplicates and 3 equipment blank and analyzed for total lead.
- Total lead concentrations for all final CS samples were detected at concentrations below the cleanup criteria of 1,400 mg/kg.
- Collected 22 soil samples and analyzed for TCLP lead from untreated soil stockpiles (CPU).
- TCLP results for CPU samples collected from 1 stockpile of untreated soil were less than the regulatory level of 5 mg/l for lead, therefore, 120 tons of soils did not require treatment.
- TCLP results for CPU samples collected from the other 21 stockpiles of untreated soil ranged from 26 to 288 mg/l.
- Treated 2,955 tons of lead impacted soils using 107 tons of reagent (3.6 percent by weight).
- Collected 7 soil samples and analyzed for TCLP lead from treated soil stockpiles (CPT).
- TCLP results for CPT samples collected from 7 stockpiles of treated soil indicated all stockpiles with lead not detected or below the regulatory level of 5.0 mg/l, indicating the soil could be disposed of as a non-hazardous waste.
- Transported and disposed of 3,182 tons that consisted of 2,955 tons of treated soil, 107 tons of reagent, and 120 tons of untreated soil.
- Placed and compacted 2,506 cubic yards of backfill.
- Seeded and mulched 0.61 acres.

3.1 Excavation of Lead-Containing Soil

A total of approximately 7,848 tons of soil were excavated from the unpaved portion of the site, a total of 1,046 tons of soil were excavated from the parkway area, and a total of 3,075 tons of soil were excavated from the paved area of the site. In addition, approximately two cubic yards of sediment were removed from under the east side of the former mill building at Environ sample location SS-57. Sheet 1 illustrates the approximate depths of the excavated areas of the site. All depths cited are referenced to ground surface existing at the commencement of excavation activities. Depths of excavation ranged from 2.0 feet to 4.0 feet in the unpaved area with the exception that soils were excavated to a depth of 9.0 to 11.5 feet in the area around the nine underground storage tanks. Depths of excavation ranged from 1.o to 2.0 feet in the parkway area and the depths of excavation ranged from 0.5 to 7.5 feet in the paved area.

Contaminated soils excavated from the site generally consisted of a fill material of silty sand and some clay with debris consisting of wood, metal, rocks, bricks, and concrete. The underlying native soil generally consisted of a gray to dark gray to black, sandy to silty clay. The fill material in the parkway area consisted mostly of sand with cinders underlain by clay. In general, lead concentrations typically decreased to concentrations ranging from 4.5 mg/kg to 200 to 300 mg/kg in the underlying clay soils.

As excavation proceeded, in-situ lead screening was performed using a portable x-ray fluorescence (XRF) instrument. Excavation was continued in an area until the XRF indicated that the total lead content of the soil was less than the EPA criterion of 1,400 mg/kg. A confirmation soil (CS) sample was then collected from the excavation for laboratory analysis to demonstrate that the EPA criterion was met. XRF screening and confirmation sampling activities are described in Sections 4.1 and 4.2, and sampling locations are shown in Sheet 1.

Material removed was placed in stockpiles of approximately 100 cubic yards. These untreated soil piles were labeled SPU-001 through SPU-074 for the unpaved and parkway areas (Table 1) and CPU-1 through CPU-22 for the paved area (Table 2). The piles were sampled and analyzed for TCLP lead.

All samples were collected and analyzed for TCLP lead using EPA method 1311 and 6010B in accordance with the approved RD/RA and associated Quality Assurance Project Plan (QAPP). The analytical reports are presented in Appendix A, Volume II.

3.2 Soil Stabilization

The objective of the soil stabilization process was to eliminate the presence of soluble lead in soil to concentrations below the regulatory TCLP concentration of 5.0 mg/l. Specifically, lead-containing soil was stabilized by onsite treatment such that lead concentration in the TCLP extract did not exceed 5.0 mg/l. Treatment to below this concentration allows the stabilized soil to be disposed of as nonhazardous waste at a Subtitle D landfill.

A total of approximately 10,828 tons of soil were stabilized with 659 tons of the reagent EnviroBlend®, using the process described below. A total of 7,236 tons of soil were treated from the unpaved area, a total of 637 tons of soil were treated from the parkway area, and a total of 2,955 tons of soil were treated from the paved area.

3.2.1 Treatment Process

The objective of the soil stabilization was to eliminate the presence of soluble lead in soil to concentrations below the Universal Treatment Standard (UTS). Specifically, lead-containing soil was stabilized such that the TCLP lead extract did not exceed 5.0 mg/l. Treatment to this concentration allowed the stabilized soil to be disposed of as nonhazardous waste at a Subtitle D landfill. Material is considered characteristically hazardous for lead toxicity if concentrations of lead in TCLP-generated extract meet or exceed 5.0 mg/l.

A pug mill stabilization system was used to provide a safe, reliable method to treat lead-containing soil so that the treated material meets the performance criteria. The stabilization system included control apparatus necessary to meet local, state, and federal regulations for air emissions and fugitive dust. The stabilization system also met applicable state and local noise pollution control regulations.

Stockpiles were made for storing lead-containing soil prior to and following treatment. The stockpiles were constructed in 100 cubic yard units and were located on the concrete building slab in the central portion of the site. The stockpiles were placed under an impermeable geomembrane cover with a minimum thickness of 10 mils. The stockpiles were covered to eliminate concerns for precipitation entering the stockpiles.

The untreated stockpiles were sampled for TCLP lead at a frequency of 1 per 100 cubic yards. Those stockpiles that are found to be nonhazardous without treatment were disposed of at a Subtitle D landfill, without stabilization.

Prior to full-scale operations, a field demonstration was performed. At least 100 cubic yards of lead-containing soil was processed and tested for volume increase and TCLP lead. Two representative samples were collected from the treated material for analysis. The full-scale processing equipment was then used for the field demonstration. EnviroBlend®, mix ratios, and mixing procedures used during the field demonstration were the same as those used for the remainder of the Remedial Action. The results of process confirmation sampling collected after completion of treatment indicated that the resulting TCLP lead concentrations were below the regulatory limit of 5 mg/l. The field demonstration indicated that a effective treatment and stabilization was achieved when 3 to 4 percent EnviroBlend® was used. This ratio was then used throughout the remainder of the treatment process. The lead-containing soil used for the field demonstration was obtained from the northwest portion of the site where the total lead concentrations were the highest.

EnviroBlend®, a two-component reagent containing a phosphate compound and a buffer, was used as the stabilizing agent. The phosphate compound provides a source of phosphate ions, which form an insoluble salt with the lead. The buffer controls the pH in a range where metals are insoluble. The soil, EnviroBlend®, and a small amount of water were mixed in the pug mill until a homogeneous mixture was achieved. Dust control was achieved using a water spray. All stockpiles were covered at the end of each day to prevent precipitation from entering the stored materials.

The processing and staging areas were inspected on a daily basis and after each precipitation event to insure the integrity of the liner and cover systems. No problems were noted during the onsite treatment period. At the completion of onsite stabilization activities, the pug mill components and excavator were decontaminated by scraping to remove all adhering materials. These materials were added to the final batch of treated material prior to sampling. The pug mill was then removed from the processing area to allow for removal and offsite disposal of the 10-mil liner used to construct the treatment area.

3.2.2 Management of Rubble and Large Debris

During site excavation activities, rubble and large debris was sorted from the soil before the soil was mixed and treated in the pug mill. All rubble and debris was handled as contaminated material and was stabilized onsite prior to disposal offsite. Treatment was performed by mixing EnviroBlend® with the rubble and debris in rolloffs using a front-end loader to blend the mixture.

3.2.3 Process Confirmation Sampling

Stabilized soil was managed in stockpiles within the treatment area until sampling and analysis confirmed that a batch had been successfully treated. Tests for TCLP lead were performed at a frequency of 1 per 500 cubic yards of material. Samples for post-treatment testing were generally collected immediately after treatment. Retesting was performed on treated material if the TCLP results were greater than 80 percent of the required standard of 5 mg/l lead as analyzed by TCLP. Treated material that was analytically determined to meet the UTS for lead was transported offsite for disposal.

Stabilized or treated soil stockpiles of approximately 500 cubic yards each were labeled SPT-001 through SPT-016 and one rubble pile was labeled RPT-001 for the unpaved and parkway areas (Table 3) and CPT-1 through CPT-7 for the paved area (Table 4). The piles were sampled and analyzed for TCLP lead.

All samples were collected and analyzed for TCLP lead using EPA method 1311 and method 6010B in accordance with the approved RD/RA and associated QAPP. The analytical reports are presented in Appendix A, Volume II.

The results confirm successful stabilization of all batches with final TCLP lead concentrations ranging from less than 0.005 mg/l to 3.3 mg/l for the unpaved and parkway area, and ranging from less than 0.005 mg/l to 2.5 mg/l for the paved area, significantly below the 5 mg/l standard. Based on these results, none of the batches required retreatment prior to disposal.

Upon receipt of the analytical results confirming successful treatment, the stabilized material was temporarily stockpiled in a lined and bermed containment area until transportation could be arranged. The stockpiles were covered at all times when they were not being actively worked, at the end of each day and during periods of high wind or rain.

4.0 Sampling and Analysis of Soil and Air

4.1 X-Ray Fluorescence Field Screening

4.1.1 Screening Locations

XRF field screening was performed during soil excavation to maximize the efficiency of excavation operations and to help ensure that the EPA criterion for lead was met. Excavation of soil continued until the XRF measurement indicated total lead concentrations of less than 1,400 mg/kg at a given location. A total of 980 XRF screening locations were used for the unpaved area, a total of 90 screening locations were used for the parkway area, and a total of 265 screening locations were used for the paved area. XRF screening locations and associated CS sample locations and the analytical results and the depth for each screening location are summarized in Tables 5 and 6 for the unpaved and paved area, respectively. The locations of these screening locations are shown on Sheet 1. Screening locations were spaced at a frequency of 1 per 100 square feet over the base of the excavated area.

4.1.2 XRF Screening Procedures

Prior to screening the excavated area, *in-situ* measurements of soil lead concentrations collected using the XRF were calibrated against the lead concentrations of corresponding soil samples analyzed in the laboratory. The data indicated that the XRF measurements were higher in concentration than the analytical results; however, as a screening tool, the XRF readings generally provided a relative indication that the total lead concentrations in the field were either above or below the cleanup criterion of 1,400 mg/kg.

Each location selected for XRF screening was flat and cleared of debris. The instrument's test guard was placed between the soil surface and the instrument prior to a measurement. Measurements were taken for 10 to 30 seconds following exposure of the x-ray source to maximize the accuracy of the data. One to three measurements were made at each location. The average value of the measurements for each location is shown in Tables 5 and 6.

Screening for lead concentrations in site soils was performed in the field using a hand-held XRF instrument. XRF screening was conducted by trained and certified field personnel. The instrument's internal calibration was checked against a reference standard once each day prior to use. The instrument was recalibrated if the measured lead concentration differed from the standard by more than 10 percent. In addition, the XRF was recalibrated once during each continuous hour of use in the field.

4.2 Excavation Confirmation Sampling

4.2.1 Confirmation Sampling Locations

Once XRF screening results and visual observations indicated that the EPA criterion for lead had been attained, confirmatory soil samples were collected for laboratory analysis. The locations of these samples are shown on Sheet 1. Soil samples were collected from the base of the excavation at a frequency of approximately 1 per 1,000 square feet.

A total of 51 confirmation soil (CS) samples including an additional 6 duplicates and 5 equipment blanks were collected from the unpaved area and analyzed for total lead (Table 7). A total of 10 CS samples including 2 duplicates and 1 equipment blank were collected from the parkway area and analyzed for total lead (Table 7). In addition, three surface samples CS-301, CS-302, and CS-303 (Table 7) were collected from the parkway area (Sheet 1) and tested for total lead to assist with determining the volume of reagent needed to treat the parkway soils.

A total of 46 confirmation soil (CSP) samples including 5 duplicates and 3 equipment blank were collected from the paved area and analyzed for total lead (Table 8).

All samples were collected and analyzed for total lead using EPA method SW846 6010B in accordance with the approved RD/RA and associated QAPP. The analytical reports are presented in Appendix A, Volume II.

4.2.2 Confirmation Sampling Results

All total lead concentrations for all final confirmation samples were detected at concentrations below the cleanup criteria of 1,400 mg/kg. The total lead concentration for soil sample location CS-034 collected at a depth of 4 feet bgs was 10,200 mg/kg; however, during removal of the tanks, this area was excavated to a depth of 9 feet bgs and total lead was detected at a concentration of 22.8 mg/kg in CS sample UST-16 (Table 7).

4.3 Perimeter Air Monitoring

To demonstrate that ambient concentrations of air-borne lead remained within acceptable levels at the site perimeter, air monitoring was conducted in general accordance with 40 CFR 50, Appendix G and "Guidance for Ambient Air Monitoring at Superfund Sites", Report ASF-4, April 1993. High-volume particulate samplers were placed at four locations, one location upwind and three locations downwind of remediation activities. To establish baseline conditions at the site, initial monitoring was performed on May 14, 1999 (Table 9), a day when excavation was not being conducted onsite. During site excavation activities, monitoring was performed during the first two weeks of project start-up, at the time of potential maximum air emissions (i.e., movement of soils containing the elevated lead concentrations), and periodically thereafter. This sampling schedule provided monitoring protective of human health and the environment, and coverage characterizing the range of remedial activities and site conditions occurring at the site.

Perimeter air samples were collected using four General Metal Works model GMWL-2000 H high volume air sampling systems. These samplers were calibrated prior to use, according to the manufacturer's specifications. Calibration was checked on a weekly basis, and the instruments were recalibrated as needed.

Perimeter air samples were collected between May 14, 1999 to July 30, 1999, during site operations, and were analyzed for total suspended particulates (TSP) and total lead. Air monitoring was performed on May 14th, May 15th, May 18th , May 19th, May 22nd, June 4th, June 8th, June 15th, June 18th, June 22nd, June 30th, July 10th, July 22nd, and July 30th (Table 9). The resulting TSP and total lead concentrations for these samples are presented in Table 9, along with notes indicating site activities and site conditions for each date. Results were compared to the National Ambient Air Quality Standards (NAAQWS) for lead of 1.5 micrograms per cubic meters ($\mu g/m^3$) and for particles of 10- microns or less (PM10) of 150 $\mu g/m^3$. Typical particulate size distribution as weight of emissions for PM10 ranges between 10 and 55 percent of total particulate weight.

The results indicate that TSP and lead associated with onsite remedial activities remained within acceptable levels during the Remedial Action. On three occasions, June 22nd, July 22nd, and July 30th, upwind TSP concentrations exceeded the PM10 standard of 150 $\mu g/m^3$. On two occasions, June 10th and July 30th, upwind total lead concentrations exceeded the lead standard of 1.5 $\mu g/m^3$. The upwind concentrations were higher than the downwind concentrations because of observed significant dust levels contributed by wind blowing across the adjacent vacant properties to the west and east of the Dutch Boy site.

All samples were collected and analyzed for total lead using EPA method SW846 7421 and for TSP using EPA method CFR50B Appendix B and in accordance with the approved RD/RA and associated QAPP. The analytical reports are presented in Appendix B, Volume II.

5.0 Underground Storage Tank Closure and Removal

Nine underground storage tanks were present in the northwest portion of the site. The tanks had an aggregate capacity of approximately 150,000 gallons and consisted of three 30,000-gallon and six 10,000-gallon capacity tanks. The tanks stored linseed oil, mineral spirits, and fuel oil. In June 1986, the IEPA disposed of liquids, solids, and sludges contained in all tanks at the site. Therefore, the storage tanks are presumed empty. In 1987, IEPA assessed the structural integrity of the tanks and concluded that they were structurally sound and did not leak. The tanks were reportedly empty; however, upon inspection it was determined that each of the tanks contained storm water that had accumulated in the tanks.

5.1 Storm and Tank Water Removal and Disposal

Approximately 113,500-gallons of storm water was pumped from the tanks and disposed of as non-hazardous waste at the Waste Management CID Biological Treatment Center in Calumet, Illinois. A sample of the water was collected in each tank and sent to Great Lakes Environmental for characterization. All samples were collected and analyzed for volatile organic compounds (VOCs) using EPA method 8260, polycyclic aromatic hydrocarbons (PAHs) using EPA method 8270, metals (including cadmium, total chromium, hexavalent chromium, copper, iron, mercury, nickel, and zinc) using EPA methods 3015A/6010B and method 7470 for mercury, hexavalent chromium using EPA method 7196, cyanide using EPA method 9012, total suspended solids using EPA method 160.2, biochemical oxygen demand (BOD) using EPA method 405.1, and fats, oil, and greases using EPA method 423.1, and in accordance with the approved RD/RA and associated QAPP. The analytical results are summarized in Tables 10, 11, and 12, and the reports are presented Appendix C, Volume II.

5.1 Tank Closure and Soil Sample Results

The tanks were not registered. Registration documentation is provided in Appendix D, Volume II of the report.

The storage tanks were closed by removal in accordance with the requirements of Title 35 of the Illinois Administrative Code (IAC), Subtitle G, Part 731, Underground Storage Tanks; and Part 732, Petroleum Underground Storage Tanks. Removal of the tanks was performed in accordance with the American Petroleum Institute Bulletin No. 1604, Recommended Practice for Abandonment or Removal of Underground Tanks. Additionally, the underground storage tank closure requirements of the City of Chicago, Department of Environment, and the Office of the Illinois State Fire Marshal, Division of Petroleum and Chemical Safety, were followed.

Prior to removal of the underground storage tanks, an "Application for Permit to Remove Underground Storage Tanks for Petroleum and Hazardous Tanks" will be filed with the City of Chicago, Department of Environment. The application included information on the site, the tank owner, and the tanks. The application was submitted by the tank removal contractor. The removal contractor, Remediation Services, Inc. was registered with the State of Illinois Fire Marshall's Office and the City of Chicago, Department of Environment.

As the excavation proceeded near tanks T-1 and T-2 (Sheet 1) soils were encountered that appeared to be impacted with petroleum hydrocarbons. One soil sample, CS-401, was collected near tank T-1, and submitted to the laboratory for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and polycyclic aromatic hydrocarbon (PAH)s. The analytical results, presented in Table 13, were compared to the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action Objectives (TACO) Tier I soil standards for industrial-commercial, soil exposure scenario for ingestion. This scenario was chosen because it is more restrictive than other exposure routes. BTEX were not detected and PAHs were not detected with the exception of benzo(a)anthracene, chrysene, fluoranthene, and pyrene detected at concentrations of 24, 66, 70, and 52 micrograms per kilogram (μg/kg), below the TACO Tier 1 standards (Table 13).

Each tank was covered with a concrete pad that was 2.0 to 4.0 feet thick and each tank was totally encased in concrete and flowable fill (low psi concrete). Approximately 234 cubic yards of concrete were removed from the underground storage tank area and disposed of offsite. Approximately 925 cubic yards of flowable fill were removed from around the tanks. Additional excavated soil was generated from the removal of the nine underground storage tanks. Areas where soil had been excavated to a depth of 4 feet bgs were further were excavated to a 9 to 13 feet bgs. A hard dense clay as encountered at a depth from 9 to 13 feet bgs.

The atmosphere in the underground storage tanks and the excavation area was monitored with a Combustible Gas Indicator (CGI), for flammable or combustible vapor concentrations until the tanks were removed from the excavations. Monitoring of the storage tanks was performed at three levels in the tanks (bottom, middle, and top). No flammable vapors were detected.

A Tank Specialist from the City of Chicago was onsite before cutting and cleaning operations or removal of the tanks proceeded. The tanks were removed offsite for proper recycling at a scrap metal dealer. A certificate of destruction was obtained verifying disposal of the tanks. A Notification for Underground Storage Tanks form was filed with the Office of the Illinois State Fire Marshal, Division of Petroleum and Chemical Safety within 30 days after the closure of the storage tanks. Documents regarding tank closure are presented in Appendix D, Volume II of this report.

A thin-walled tube sample was collected by ESC from the clay soil beneath the tanks and submitted to Soil Engineering Testing, Inc., of Bloomington Minnesota for testing of hydraulic conductivity. The soil was identified as a sandy lean with a little gravel. The hydraulic conductivity for clay sample was 1.8 x 10^{-8} centimeters per second (cm/s). A copy of the laboratory report is presented in Appendix E, Volume II of this report.

Groundwater was not encountered during the tank excavation.

Soil excavated from around tanks T-1 and T-2 were stockpiled as SPU-031. A sample from SPU-031 was collected and submitted to the laboratory for analysis of VOCs, PAHs, and petroleum hydrocarbons consisting of gasoline range organics (GRO) and diesel range organics (DRO). The analytical results, presented in Table 14, were compared to the IEPA TACO Tier I soil standards for industrial-commercial, soil exposure scenario for ingestion. VOCs were not detected and PAHs were not detected with the exception of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, fluorene, indeno(1,2,3-cd)pyrene, 1-methynapththalene, 2-methylnapththalene, phenanthrene, and pyrene detected at concentrations of 2.3, 1.7, 1.1, 0.72, 5.8, 1.1 26, 21, 19, and 3.8 mg/kg), below the TACO Tier 1 standards (Table 14). DRO was detected at a concentration of 4,100 mg/kg.

A total of 17 confirmation soil samples were collected from around the underground storage tanks at a depth of nine feet bgs including 2 duplicates and 2 equipment blanks and analyzed for total lead. The results are presented in Table 7. Total lead concentrations for all underground storage tank (UST) samples were detected at concentrations below the cleanup criteria of 1,400 mg/kg with the exception of one sample with total lead detected at a concentration of 1,700 mg/kg, collected at a depth of 9 feet bgs.

A total of 4 UST confirmation samples (UST-001 through UST-004) were collected from around the two 10,000-gallon fuel oil and mineral spirits underground storage tanks, T-1 and T-2

(Sheet 1), at a depth of 6.5 and 7.5 feet bgs and analyzed for VOCs and SVOCs. The VOC and SVOC results for UST-001 through UST-004 are presented in Tables 15 and 16, respectively.

A total of 4 UST confirmation samples (UST-006 through UST-009, including 1 duplicate, were collected from around the four 10,000-gallon linseed oil and mineral spirits underground storage tanks, T-3 through T-6 (Sheet 1), at a depth of 13 feet bgs and analyzed for BTEX and PAHs. The BTEX and PAHs results for UST-006 through UST-009 are presented in Tables 15 and 16, respectively.

A total of 8 UST confirmation samples (UST-010 through UST-017), including 1 duplicate, were collected from around the three 30,000-gallon linseed oil and mineral spirits underground storage tanks, T-7 through T- 9 (Sheet 1), at a depth of 9.0 feet bgs and analyzed for BTEX and PAHs. The BTEX and PAHs results for UST-010 through UST-017 are presented in Table 17.

A total of one UST confirmation sample (UST-005) was collected from the piping area near the loading dock at a depth of 2.0 feet bgs and analyzed for BTEX and PAHs. The BTEX and PAHs results for UST-005 are presented in Table 18.

Detected concentrations of various VOCs, SVOCs, BTEX, and PAHs were below the IEPA TACO Tier I soil standards for industrial-commercial exposure via ingestion.

The flowable fill was tested VOCs, PAHs, total lead (Table 19) and TCLP lead, flash point, paint filter and pH (Table 20). The results indicated that the flowable fill could be used as backfill in the deeper part of the tank excavation. Analytical results for total lead concentrations were between 340 to 486 mg/kg and leachable lead was not detected. The flowable fill was used as backfill from the bottom of the underground storage tank excavations to no higher than a depth of 4 feet bgs.

All samples were collected and analyzed using EPA methods in accordance with the approved RD/RA and associated QAPP. The analytical reports are presented in Appendix A, Volume II.

6.0 Debris Pile Removal and Disposal

A large debris pile, estimated to contain 800 cubic yard of debris, was present on the southern portion of the site. The pile contained debris from the post-1980 demolition activities and contained some asbestos-containing material (ACM). In addition, a smaller debris pile, estimated to contain 50 cubic yards, was present along the loading dock, south of the perimeter fence. This pile contained brick, mortar, and concrete.

The Extent of Contamination Survey, dated November 19, 1997, prepared by Environ, identified asbestos-containing material in the large debris pile. Specifically, two of four samples collected from the pile were determined to contain greater than 1 percent asbestos. ACM consisted of cementitious transite and roofing tar and felt. The Extent of Contamination Survey also indicated that TCLP lead was not detected above 5.0 mg/l in four samples collected from the debris pile. However, ESC observed soil mixed in with the debris at the bottom of the large debris pile. ESC collected one sample, DP-001, and submitted the sample to the laboratory for TCLP lead analysis. TCLP lead was detected at a concentration of 13.3 mg/l (Table 21). Approximately 40 cubic yards of debris that potentially contained lead impacted soil was treated with reagent before transported offsite. Sample SWDP-1 was collected from the treated debris and tested for TCLP lead. TCLP lead was not detected in sample SWDP-1 (Table 21). The treated part of the debris pile was disposed of as non-hazardous waste. The analytical are presented in Appendix A, Volume II.

Removal of the debris pile was performed in accordance with the "Asbestos Abatement Workplan for the Former Dutch Boy Site Construction Debris Pile," dated May 3, 1999, prepared in accordance with applicable EPA Occupational Safety and Health Administration, State of Illinois, and local regulations and was signed by David Slocum, CIH Illinois ID#100-4883, of NOVA Consulting Group, an EPA accredited and Illinois licensed asbestos project designer.

NOVA provided air monitoring services during the removal of the debris pile. The debris pile was wetted during the removal process.

Approximately 350 cubic yards from the asbestos-containing debris piles that consisted of 275 cubic yards of ACM, 45 cubic yards of asphalt, brick, and concrete, and 30 cubic yards of rebar, were removed and transported offsite for disposal at Laraway RDF, in Elwood Illinois.

7.0 Loading and Disposal of Treated and Untreated Material

Non-hazardous soil and stabilized soil were shipped to the Waste Management CID RDF landfill in Calumet, Illinois, for disposal. A total of 15,610 tons of material, including 1,141 tons of non-hazardous, untreated soil and 14,469 tons of stabilized soil and reagent were loaded and shipped offsite to the disposal facility.

A total of 8,180 tons of material, including 612 tons of non-hazardous, untreated soil and 7,568 tons of stabilized soil and reagent were from the unpaved area; a total of 1,066 tons of material, including 409 tons of non-hazardous, untreated soil and 657 tons of stabilized soil and reagent were from the parkway area; and, a total of 3,182 tons of material, including 120 tons of non-hazardous, untreated soil and 3,062 tons of stabilized soil and reagent were from the paved area.

Each shipment was accompanied by a properly completed, non-hazardous waste manifest and, for stabilized soil shipments only, laboratory analytical data showing the results of the TCLP lead analyses. Copies of all of the non-hazardous waste manifests are retained by ESC.

8.0 Site Restoration

The excavated area was backfilled after completion of the remedial action to approximate pre-excavation elevations and graded to drain, using approximately 11,285 cubic yards of clean material obtained from offsite. Approximately 8,079 cubic yards of backfill were placed in the unpaved area; approximately 700 cubic yards of backfill were placed in the parkway area; and, approximately 2,506 cubic yards of backfill were placed in the paved area.

The backfill was placed into the excavations in maximum 8-inch lifts and compacted at each lift. Backfill compaction testing in the unpaved area was performed by Professional Service Industries, Inc, of Hillside Illinois. The results of the backfill testing are provided in Volume II. Backfill testing was not in the paved area because of the shallow excavation depth in some areas (0.5 to 2.0 feet bgs) and because of the footings and foundations encountered during the excavation (Sheet 1).

The backfill was non-saturated, well-graded soil provided by B & B Pulverizing of Frankfort, Illinois. It was analyzed and certified free of hazardous substances and deleterious materials such as large roots, rocks or vegetative matter. Table 22 summarizes the results of analysis of samples collected from the backfill source. The backfill fill material was analyzed for VOCs, SVOCs, organopesticides, polychlorinated biphenyls (PCBs), petroleum hydrocarbons consisting of gasoline range organics (GRO) and diesel range organics (DRO), total cyanide, and metals (Table 22).

VOCs, SVOCs, PCBs, DRO, GRO, total cyanide, and organopesticides were not detected with the exception of Dieldrin, an organopesticide, detected at a concentration of 25 µg/kg. Antimony, cadmium, mercury, silver, sodium and thallium were not detected but various metals were detected at concentrations similar to background levels that are typical for this region.

All samples were collected and analyzed for total lead using EPA methods and in accordance with the approved RD/RA and associated QAPP. The analytical reports are presented in Volume II.

The backfilled areas were seeded and mulched after backfilling was completed.

9.0 Supplemental Project Information

All on-site operations and operating conditions were documented in accordance with the requirements of the RD/RA and the Technical Specifications (March 9, 1999) and the QAPP. The following supplemental project information is retained by ESC:

- Manifests and Waste Profiles
- Treatment and Reagent Load Logs
- Daily Inspection/Quality Control Reports
- Daily Safety Meeting and Summary Reports
- Photographs

10.0 Summary of Results and Conclusions

The Dutch Boy site located at 12000 to 12054 South Peoria Street and 901 to 935 West 120th Street, Cook County, Chicago, Illinois has been successfully remediated. The Remedial Action was conducted by ESC, on behalf of NL Industries, Inc., during the period from May 6, 1999 and October 22, 1999, in accordance with the RD/RA Work Plan and the terms of the March 26, 1998, Unilateral Administrative Order (UAO) issued to NL by the EPA. In addition, Remedial Action was conducted in accordance with the SRA and the June 9, 1999, Consent Decree between the City of Chicago and NL. The Remedial Action addressed the EPA established risk-based cleanup goal for lead of 1,400 mg/kg for the unpaved, parkway, and paved areas. Soil remediation at the site consisted of excavation, testing, and onsite stabilization of soil containing concentrations of lead above the EPA criterion of 1,400 mg/kg, and off-site disposal of soil.

A total of approximately 11,969 tons of soil were excavated from the site. A total of 7,848 tons of soil were excavated from the unpaved area of the site, a total of 1,046 tons of soil were excavated from the parkway area, and a total of 3,075 tons of soil were excavated from the paved area of the site.

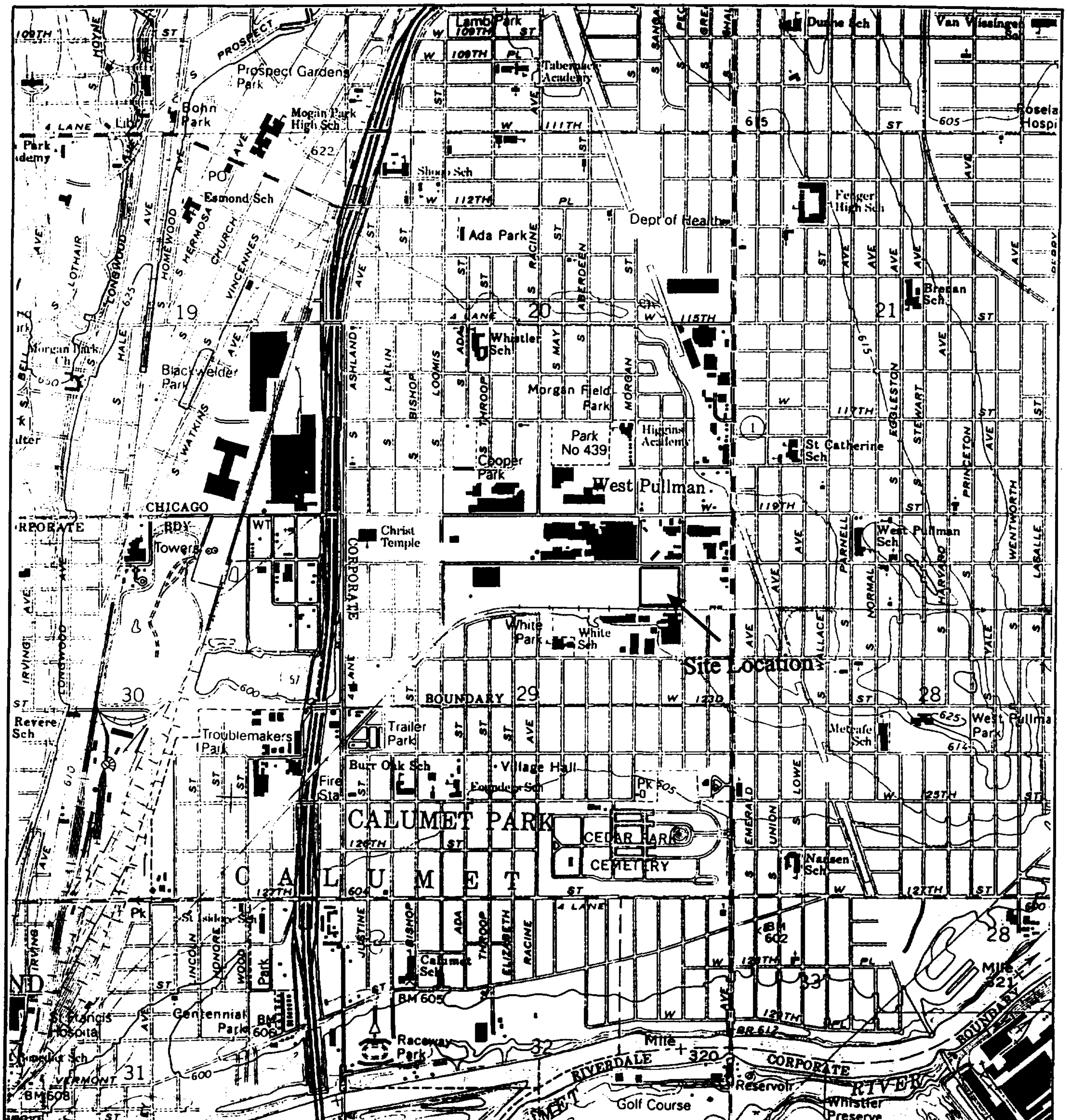
In-situ lead screening was performed using a portable XRF. Excavation was continued in an area until the XRF indicated that the total lead content of the soil was less than the EPA criterion of 1,400 mg/kg. Confirmation soil samples were then collected from the excavation for laboratory analysis to confirm the XRF results and demonstrate that the EPA criterion was met.

A total of approximately 10,828 tons of soil were stabilized with 659 tons of the reagent EnviroBlend®, using the process described below. A total of 7,236 tons of soil were treated from the unpaved area, a total of 637 tons of soil were treated from the parkway area, and a total of 2,955 tons of soil were treated from the paved area.

Non-hazardous soil and stabilized soil were shipped to the Waste Management Subtitle D CID RDF landfill in Calumet, Illinois, for disposal. A total of 15,610 tons of material, including 1,141 tons of non-hazardous, untreated soil and 14,469 tons of stabilized soil and reagent were loaded and shipped offsite to the disposal facility. A total of 8,180 tons of material, including 612 tons of non-hazardous, untreated soil and 7,568 tons of stabilized soil and reagent were from the unpaved area; a total of 1,066 tons of material, including 409 tons of non-hazardous, untreated soil and 657 tons of stabilized soil and reagent were from the parkway area; and, a total of 3,182 tons of material, including 120 tons of non-hazardous, untreated soil and 3,062 tons of stabilized soil and reagent were from the paved area.

Remedial action also included removal and closure of nine underground storage tanks and lead impacted soil excavated from the area around the tanks. Removal and offsite disposal of two debris piles.

Figure



Reference
Blue Island Topographic Quadrangle
Illinois – Cook Co., US
Photorevised 1993 Scale 1:24,000

Quadrangle Location

0 2000 4000
Scale in Feet

ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 20190
703-709-6500

Figure 1
Site Location
Dutch Boy Site
Chicago, Illinois

Tables

Table 1

Excavation Untreated Soil Stockpile Samples - Unpaved and Parkway Areas
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	**SPU-001**	**SPU-002**	**SPU-202 (b)**	**SPU-003**	**SPU-004**	**SPU-005**	**SPU-006**	**SPU-007**	**SPU-207 (c)**	**SPU-008**	**SPU-009**
TCLP Lead	89.5	19.1	17.9	118	16.2	11.3	2.1	2.0	1.8	1.8	3.6

Analyte (mg/l)	**SPU-010**	**SPU-011**	**SPU-012**	**SPU-013**	**SPU-014**	**SPU-015**	**SPU-015A**	**SPU-016**	**SPU-017**	**SPU-018**	**SPU-019**
TCLP Lead	2.9	6.3	1.4	80.1	19.3	4.9	5.4	8.7	2.2	17.0	15.6

Analyte (mg/l)	**SPU-020**	**SPU-021**	**SPU-022**	**SPU-023**	**SPU-024**	**SPU-025**	**SPU-026**	**SPU-027**	**SPU-028**	**SPU-228 (d)**	**SPU-029**
TCLP Lead	28.7	7.5	41.4	38.7	39.0	48.0	32.1	45.5	69.2	62.7	62.8

Analyte (mg/l)	**SPU-030**	**SPU-031**	**SPU-032**	**SPU-033**	**SPU-034**	**SPU-035**	**SPU-036**	**SPU-037**	**SPU-237 (e)**	**SPU-038**	**SPU-039**
TCLP Lead	39.0	69.4	116	79.7	54.2	232	171	125	219	114	181

Analyte (mg/l)	**SPU-040**	**SPU-041**	**SPU-042**	**SPU-043**	**SPU-044**	**SPU-045**	**SPU-245 (f)**	**SPU-046**	**SPU-047**	**SPU-048**	**SPU-049**
TCLP Lead	308	187	134	362	247	230	291	393	391	308	229

Analyte (mg/l)	**SPU-050**	**SPU-051**	**SPU-052**	**SPU-053**	**SPU-054**	**SPU-055**	**SPU-056**	**SPU-256 (g)**	**SPU-057**	**SPU-058**	**SPU-059**
TCLP Lead	224	188	257	366	10.2	10.5	39.5	36.8	522	208	280

Analyte (mg/l)	**SPU-060**	**SPU-061**	**SPU-062**	**SPU-063**	**SPU-064**	**SPU-P65 (h)**	**SPU-P66 (h)**	**SPU-067**	**SPU-267 (i)**	**SPU-P68 (h)**	**SPU-P69 (h)**
TCLP Lead	167	111	27.6	342	116	31.2	10.0	14.1	18.2	4.0	6.6

Analyte (mg/l)	**SPU-P70 (h)**	**SPU-P71**	**SPU-072**	**SPU-073**	**SPU-074**
TCLP Lead	2.0	1.3	12.1	139	136

Table 1 (continued)

Excavation Untreated Soil Stockpile Samples - Unpaved and Parkway Areas
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	EB-51799	EB-52499	EB-60599	EB-60999	EB-61499	EB-63099	EB-71299
TCLP Lead	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

a/ U = undetected; mg/l = milligrams per liter; EB = Equipment Blank; TCLP = Toxicity Characteristics Leaching Procedure
b/ duplicate sample of SPU-002
c/ duplicate sample of SPU-007
d/ duplicate sample of SPU-028
e/ duplicate sample of SPU-037
f/ duplicate sample of SPU-045
g/ duplicate sample of SPU-056
h/ parkway soil
i/ duplicate sample of SPU-067

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Table 2

Excavation Untreated Soil Stockpile Samples - Paved Area
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	CPU-1	CPU-2	CPU-3	CPU-4	CPU-5	CPU-6	CPU-7	CPUR-8	CPU-9	CPU-10	CPU-11
TCLP Lead	97.4	61.1	67.8	94.2	38.9	88.9	186	0.98	112	288	162

Analyte (mg/l)	CPU-12	CPU-13	CPU-14	CPU-15	CPU-16	CPU-17	CPU-18	CPU-19	CPU-20	CPU-21	CPU-22
TCLP Lead	114	51.9	57.2	168	128	75.1	26	234	146	317	187.0

Analyte (mg/l)	CSP-10 (b)
TCLP Lead	23.1

a/ U = undetected; mg/l = milligrams per liter; TCLP = Toxicity Characteristics Leaching Procedure
b/ Confirmation sample CSP-10 total lead - 1,100 millgram per kilogram (mg/kg)

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Table 2

Excavation Untreated Soil Stockpile Samples - Paved Area
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	CPU-1	CPU-2	CPU-3	CPU-4	CPU-5	CPU-6	CPU-7	CPUR-8	CPU-9	CPU-10	CPU-11
TCLP Lead	97.4	61.1	67.8	94.2	38.9	88.9	186	0.98	112	288	162

Analyte (mg/l)	CPU-12	CPU-13	CPU-14	CPU-15	CPU-16	CPU-17	CPU-18	CPU-19	CPU-20	CPU-21	CPU-22
TCLP Lead	114	51.9	57.2	168	128	75.1	26	234	146	317	187.0

Analyte (mg/l)	CSP-10 (b)
TCLP Lead	23.1

a/ U = undetected; mg/l = milligrams per liter; TCLP = Toxicity Characteristics Leaching Procedure
b/ Confirmation sample CSP-10 total lead - 1,100 millgram per kilogram (mg/kg)

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Table 3

Excavation Treated Soil Stockpile Samples - Unpaved and Parkway Areas
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	SPT-001	SPT-002	SPT-202 (b)	SPT-003	SPT-004	SPT-005	SPT-006	SPT-007	SPT-008	SPT-009	SPT-010
TCLP Lead	0.5 U	0.5 U	0.5 U	0.5 U	0.63	0.5 U	0.5 U	1.6	0.83	0.76	0.5 U

Analyte (mg/l)	SPT-011	SPT-211(c)	SPT-311(d)	RPT-001(e)	SPT-012	SPT-013	SPT-P14 (f)	SPT-P15 (f)	SPT-016
TCLP Lead	4.3	3.8	3.3	0.5 U	1.3	0.55	0.5 U	0.5 U	0.61

Analyte (mg/l)	EB-60599	EB-61999	EB-71299	EB-80399
TCLP Lead	0.5 U	0.56	0.5 U	0.5 U

a/ U = undetected; mg/l = milligrams per liter
b/ duplicate sample of SPT-002
c/ duplicate sample of SPT-011
d/ resample for treated stockpile SPT-011
e/ sample for treated rubble stockpile
f/ parkway soil

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Table 4

Excavation Treated Soil Stockpile Samples - Paved Area
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	CPT-1	CPT-2	CPT-3	CPT-4	CPT-5	CPT-6	CPT-7
TCLP Lead	0.5 U	0.5 U	1.0	1.4	0.68	2.5	0.5 U

a/ U = undetected; mg/l = milligrams per liter; TCLP = Toxicity Characteristics Leaching Procedure

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Table 5

Confirmation Soil Samples - Unpaved Area
Niton XRF and Laboratory Analytical Results for Lead
Dutch Boy Site, Chicago, Illinois (a)

Sample Location	Niton XRF (ppm)	Laboratory Analysis (mg/kg)	
CS-001	<103	4.5	
CS-002	162 ± 81	54.6	
CS-003	<105	4.8	
CS-004	200 ± 98	7.6	
CS-005	279 ± 107	245	
CS-006	169 ± 82	7.4	
CS-007	118 ± 78	35.2	
CS-008	199 ± 92	39.1	
CS-009	<113	7.3	Dup 5.9
CS-010	240 ± 88	29.1	
CS-011	204 ± 87	36.9	
CS-012	407 ± 107	31.7	
CS-013	<85	15.2	
CS-014	149 ± 63	9.5	
CS-015	<139	51.7	
CS-016	<109	5.7	
CS-017	159 ± 71	5.9	
CS-018	622 ± 136	61.6	
CS-019	212 ± 71	8.7	
CS-020	<95	26.5	
CS-021	168 ± 83	117	
CS-022	<93	9.0	
CS-023		5.4	
CS-024	472 ± 172	5.2	Dup 10.7
CS-025	134 ± 37	6.5	
CS-026	218 ± 83	112	
CS-027	<63	8.7	
CS-028	<62	5.3	
CS-029	<62	20.5	Dup 7.8
CS-030	298 ± 62	6.7	
CS-031	<73	12.1	
CS-032	<62	8.0	
CS-033	92 ± 62	26.0	
CS-034	8,614 ± 960	10,200	
CS-035	235 ± 70	16.9	
CS-036	228 ± 65	53.5	Dup 9.0
CS-037	<100	14.0	
CS-038	5,897 ± 476	1,060	
CS-039	<92	5.2	
CS-040	<122	142	

a/ ppm = parts per million; mg/kg = milligrams per kilogram;
± = plus or minus; Dup = Duplicate sample.

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Table 6

Confirmation Soil Samples - Paved Area
Niton XRF and Laboratory Analytical Results for Lead
Dutch Boy Site, Chicago, Illinois (a)

Sample Location	Sample Depth (ft)	Niton XRF (ppm)	Laboratory Analysis (mg/kg)		
CSP-1	0.5	348 ± 92	278		
CSP-2	0.5	718 ± 374	221		
CSP-3	4.0	1,098 ± 608	**1,630**		
CSP-3A	7.5	NR	567		
CSP-4	2.0	417 ± 332	312		
CSP-5	4.0	1,006 ± 338	**1,410**		
CSP-5A	7.5	NR	ND (11.5)		
CSP-6	5.0	1,547 ± 424	**4,110**		
CSP-6A	10.0	NR	52.8		
CSP-7	0.5	2,720 ± 457	110		
CSP-8	1.0	2,762 ± 600	**3,040**	Dup	1,160
CSP-8A	4.0	328 ± 173	727		
CSP-9	1.0	15,000 ± 2,232	**7,510**		
CSP-9A	4.0	334 ± 141	26.4		
CSP-10	2.0	410 ± 265	1,100		
CSP-11	3.0	888 ± 176	991		
CSP-12	2.0	2,856 ± 262	**8,440**		
CSP-12A	4.5	176 ± 126	22.2		
CSP-13	2.0	9,000 ± 1,672	**1,690**		
CSP-13A	4.5	157 ± 125	12.7		
CSP-14	2.0	4,253 ± 468	**8,740**	Dup	**10,400**
CSP-14A	4.5	291 ± NR	114	Dup	176
CSP-15	2.0	2,037 ± 568	**6,240**		
CSP-15A	3.0	190 ± NR	11.4		
CSP-16	2.0	3,216 ± 357	**3,220**		
CSP-16A	4.0	460 ± 94	79.9		
CSP-17	2.0	371 ± 167	134		
CSP-18	0.5	348 ± 374	**3,340**		
CSP-18A	1.0	NR	959		
CSP-19	0.5	3,130 ± 377	**9,030**		
CSP-19A	1.5	991 ± NR	47.8		
CSP-20	0.5	1,675 ± 476	**24,900**		
CSP-20A	1.5	203 ± NR	123		
CSP-21	0.5	2,690 ± 209	**95,000**	Dup	**74,100**
CSP-21A	2.5	177 ± NR	141		
CSP-22	0.5	1,130 ± 391	**1,820**		
CSP-22A	1.5	225 ± NR	28.3		
CSP-23	0.5	2,473 ± 383	**5,660**		
CSP-23A	1.5	221 ± NR	625		
CSP-24	0.5	NR	20.4		
CSP-25	0.5	NR	18.4		

a/ ppm = parts per million; mg/kg = milligrams per kilogram; ND = not detected, ± = plus or minus; Dup = Duplicate sample, NR = Not Recorded.

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Table 7

Excavation Confirmation Soil Samples - Unpaved and Parkway Areas
Total Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/kg)	CS-001 (2.0 ft)	CS-002 (2.0 ft)	CS-003 (2.0 ft)	CS-004 (2.0 ft)	CS-005 (2.0 ft)	CS-006 (2.0 ft)	CS-007 (2.0 ft)	CS-008 (2.0 ft)	CS-009 (2.0 ft)	CS-209 (b) (2.0 ft)
Total Lead	4.5	54.6	4.8	7.6	245	7.4	35.2	39.1	7.3	5.9

Analyte (mg/kg)	CS-010 (2.0 ft)	CS-011 (2.0 ft)	CS-012 (2.0 ft)	CS-013 (2.0 ft)	CS-014 (2.0 ft)	CS-015 (3.0 ft)	CS-016 (3.0 ft)	CS-017 (3.0 ft)	CS-018 (3.0 ft)	CS-019 (2.0 ft)
Total Lead	29.1	36.9	31.7	15.2	9.5	51.7	5.7	5.9	61.6	8.7

Analyte (mg/kg)	CS-020 (4.0 ft)	CS-021 (2.0 ft)	CS-022 (2.0 ft)	CS-023 (3.0 ft)	CS-024 (3.0 ft)	CS-224 (c) (3.0 ft)	CS-025 (4.0 ft)	CS-026 (2.0 ft)	CS-027 (3.0 ft)	CS-028 (4.0 ft)
Total Lead	26.5	117	9.0	5.4	5.2	10.7	6.5	112	8.7	5.3

Analyte (mg/kg)	CS-029 (4.0 ft)	CS-229 (d) (4.0 ft)	CS-030 (3.0 ft)	CS-031 (2.0 ft)	CS-032 (4.0 ft)	CS-033 (4.0 ft)	CS-034 (e)	CS-035 (4.0 ft)	CS-036 (4.0 ft)	CS-236 (f) (4.0 ft)
Total Lead	20.5	7.8	6.7	12.1	8.0	26.0	10,200	16.9	53.5 J	9.0

Analyte (mg/kg)	CS-037 (3.0 ft)	CS-038 (g) (4.0 ft)	CS-039 (3.0 ft)	CS-040 (3.0 ft)	CS-041 (3.0 ft)	CS-042 (3.0 ft)	CS-043 (3.0 ft)	CS-044 (3.0 ft)	CS-045 (3.0 ft)	CS-245 (h) (3.0 ft)
Total Lead	14.0	1,060	5.2	142	63.3	71.8	63.3	68.3	9.5	10.3

Analyte (mg/kg)	CS-046 (4.0 ft)	CS-047 (2.0 ft)	CS-048A (i, j) (1.0 ft)	CS-048B (j) (2.0 ft)	CS-049 (j) (1.0 ft)	CS-049B (j) (2.0 ft)	CS-050 (3.0 ft)	CS-051 (2.0 ft)	CS-052 (3.0 ft)	CS-252 (k) (3.0 ft)
Total Lead	17.5	175	21,000	15.7	3,480	11.7	38.6	22.5	13.5	12.6

Analyte (mg/kg)	CS-053 (j) (1.0 ft)	CS-053B (j) (2.0 ft)	CS-054 (j) (2.0 ft)	CS-055 (j) (2.0 ft)	CS-056 (j) (2.0 ft)	CS-057 (j) (1.0 ft)	CS-058 (j) (1.0 ft)	CS-258 (j, l) (1.0 ft)	CS-059 (j) (1.0 ft)	CS-060 (j) (1.0 ft)
Total Lead	3,700	14.3	156	159	1,080	6.5	6.0	18.2	7.4	32.9

Table 7 (continued)

Excavation Confirmation Soil Samples - Unpaved and Parkway Areas
Total Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/kg)	CS-061 (4.0 ft)	UST-001 (7.5 ft)	UST-002 (7.5 ft)	UST-003 (7.5 ft)	UST-004 (6.5 ft)	UST-204 (m) (6.5 ft)	UST-005 (2.0 ft)	UST-006 (13 ft)	UST-007 (13 ft)	UST-008 (13 ft)
Total Lead	6.6	405	14.7	61.5	1,250	335	15.7	17.3	12.3	17.8

Analyte (mg/kg)	UST-009 (13 ft)	UST-010 (8.0 ft)	UST-011 (9.0 ft)	UST-012 (9.0 ft)	UST-013 (n) (9.0 ft)	UST-014 (9.0 ft)	UST-015 (9.0 ft)	UST-215 (o) (9.0 ft)	UST-016 (p) (9.0 ft)	UST-017 (9.0 ft)
Total Lead	7.4	52.6	18.9	20.2	69.2	20.5	14.3	396	22.8	1,700

Analyte (mg/kg)	CS-301(q) (Surface)	CS-302 (r) (Surface)	CS-303 (s) (Surface)
Total Lead	14,600	34,400	2,190

Analyte (mg/l)	EB-51999	EB-52499	EB-60897	EB-62499	EB-71299	EB-72099
Total Lead	0.0063	0.02	ND (0.003)	ND (0.003)	ND (0.003)	ND (0.003)

a/ mg/kg = milligrams per kilogram; mg/l = milligrams per liter; ND (0.003) = Not detected at or above the reporting limit shown in parentheses;
EB = equipment blank; CS-3XX = Parkway surface soil samples collected before excavation; bgs - below ground surface.
b/ duplicate sample of CS-009
c/ duplicate sample of CS-024
d/ duplicate sample of CS-029
e/ sample location CS-034 (4 feet bgs) was excavated during tank removal and resampled as UST-013 (9 feet bgs).
f/ duplicate sample of CS-036
g/ sample location CS-038 (4 feet bgs) was excavated during tank removal and resampled as UST-016 (9 feet bgs).
h/ duplicate sample of CS-045
i/ original sample CS-048 was destroyed during shipment to laboratory and replaced with sample no. CS-048A
j/ parkway soil sample
k/ duplicate sample of CS-052
l/ duplicate sample of CS-058
m/ duplicate sample of UST-004
n/ UST-013 was collected at a depth of 9 feet bgs at the same location as CS-034
o/ duplicate sample of UST-015
p/ UST-015 was collected at a depth of 9 feet bgs at the same location as CS-038
q/ surface soil sample from parkway area at same location as CS-060
r/ surface soil sample from parkway area at same area as CS-048
s/ surface soil sample from parkway area at same area as CS-049

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Table 8

Excavation Confirmation Soil Samples - Paved Area
Total Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/kg)	CSP-1 (0.5 ft)	CSP-2 (0.5 ft)	CSP-3 (4.0 ft)	CSP-3A (7.5 ft)	CSP-4 (2.0 ft)	CSP-5 (4.0 ft)	CSP-5A (7.5 ft)	CSP-6 (5.0 ft)	CSP-6A (10 ft)	CSP-7 (0.5 ft)	CSP-8 (1.0 ft)
Total Lead	278	221	**1,630**	567	312	**1,410**	ND (11.6)	**4,110**	52.8	110	**3,040**

Analyte (mg/kg)	CSP-208 (b) (1.0 ft)	CSP-8A (4.0 ft)	CSP-9 (1.0 ft)	CSP-9A (4.0 ft)	CSP-10 (2.0 ft)	CSP-11 (3.0 ft)	CSP-12 (2.0 ft)	CSP-12A (4.5 ft)	CSP-13 (2.0 ft)	CSP-13A (4.5 ft)	CSP-14 (2.0 ft)
Total Lead	1,160	727	**7,510**	26.4	1,100	991	**8,440**	22.2	**1,690**	12.7	**8,740**

Analyte (mg/kg)	CSP-214 (c) (2.0 ft)	CSP-14A (4.5 ft)	CSP-214A (d) (4.5 ft)	CSP-15 (2.0 ft)	CSP-15A (3.0 ft)	CSP-16 (2.0 ft)	CSP-16A (4.0 ft)	CSP-17 (2.0 ft)	CSP-18 (0.5 ft)	CSP-18A (1.0 ft)	CSP-19 (0.5 ft)
Total Lead	**10,400**	114	176	**6,240**	11.4	**3,220**	79.9	134	**3,340**	959	**9,030**

Analyte (mg/kg)	CSP-19A (1.5 ft)	CSP-20 (0.5 ft)	CSP-20A (1.5 ft)	CSP-21 (0.5 ft)	CSP-221 (e) (0.5 ft)	CSP-21A (2.5 ft)	CSP-221A (f) (2.5 ft)	CSP-22 (0.5 ft)	CSP-22A (1.5 ft)	CSP-23 (0.5 ft)	CSP-23A (1.5 ft)
Total Lead	47.8	**24,900**	123	**95,000**	**74,100**	141	128	**1,820**	28.3	**5,660**	625

Analyte (mg/kg)	CSP-24 (0.5 ft)	CSP-25 (0.5 ft)
Total Lead	20.4	18.4

Analyte (mg/l)	EB-90999	EB-91099	EB-92199
Total Lead	ND (0.003)	ND (0.003)	ND (0.003)

a/ mg/kg = milligrams per kilogram; mg/l = milligrams per liter; ND (0.003) = Not detected at or above the reporting limit shown in parentheses;
EB = equipment blank.
b/ duplicate sample of CSP-8
c/ duplicate sample of CSP-14
d/ duplicate sample of CSP-214A
e/ duplicate sample of CSP-21
f/ duplicate sample of CSP-221A
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Table 9

Air Sample Analytical Results
Lead and Particulate Mass
Dutch Boy, Chicago, Illinois (a)

Sample #	Location	Date	Pb Mass (µg)	Air Volume (m^3)	Particulate Mass (gm)	Pb Conc (µg/m^3)	NAAQS (b) Pb (µg/m^3)	Total Particulate Mass Conc. (c) (µg/m^3)	NAAQS PM10 (d) (µg/m^3)
AS-051	East (bkgrd)	5/14/99	129.8	2,211.0	0.1262	0.0587	1.5	57.0782	150
AS-052	North (bkgrd)	5/14/99	191.2	1,521.9	0.1468	0.1256	1.5	96.4584	150
AS-053	South (bkgrd)	5/14/99	141.4	2,227.5	0.1280	0.0635	1.5	57.4635	150
AS-054	West (bkgrd)	5/14/99	209.1	2,972.3	0.1274	0.0703	1.5	42.8624	150
AS-055	NE Corner	5/15/99	284.3	2,346.4	0.1917	0.1212	1.5	81.6996	150
AS-056	SW Corner	5/15/99	69.46	1,683.6	0.1555	0.0413	1.5	92.3616	150
AS-057	South	5/15/99	66.89	2,011.9	0.1649	0.0332	1.5	81.9623	150
AS-058	West	5/15/99	172.7	2,878.7	0.1823	0.0600	1.5	63.3272	150
AS-059	NE Corner	5/18/99	944.88	2,355.0	0.0994	0.4012	1.5	42.2081	150
AS-060	NW Corner	5/18/99	22.31	2,597.0	0.0663	0.0086	1.5	25.5295	150
AS-061	SW Corner	5/18/99	19.56	1,778.8	0.0722	0.0110	1.5	40.5892	150
AS-062	SE Corner	5/18/99	19.82	2,021.1	0.0623	0.0098	1.5	30.8248	150
AS-063	NE Corner	5/19/99	422.88	2,360.2	0.1807	0.1792	1.5	76.5613	150
AS-064	NW Corner	5/19/99	114.7	2,434.3	0.1119	0.0471	1.5	45.9680	150
AS-065	SW Corner	5/19/99	36.46	1,717.6	0.1152	0.0212	1.5	67.0703	150
AS-066	SE Corner	5/19/99	68.71	1,915.3	0.1368	0.0359	1.5	71.4248	150
AS-067	Media Blank	5/19/99	1.44	-	0.0021	-	-	-	-
AS-068	NE Corner	5/22/99	244	2,414.7	0.1500	0.1010	1.5	62.1195	150
AS-069	NW Corner	5/22/99	58.3	2,600.0	0.1100	0.0224	1.5	42.3077	150
AS-070	SW Corner	5/22/99	91.5	1,826.3	0.1200	0.0501	1.5	65.7066	150
AS-071	SE Corner	5/22/99	39.3	2,089.2	0.1100	0.0188	1.5	52.6517	150
AS-072	NE Corner	5/26/99	643	2,269.1	0.1600	0.2834	1.5	70.5125	150
AS-073	NW Corner	5/26/99	58.0	2,539.7	0.0810	0.0228	1.5	31.8935	150
AS-074	SW Corner	5/26/99	20.5	1,917.3	0.0720	0.0107	1.5	37.5528	150
AS-075	SE Corner	5/26/99	33.9	2,199.5	0.0710	0.0154	1.5	32.2801	150
AS-076	NE Corner	6/4/99	48.0	2,378.7	0.1096	0.0202	1.5	46.0756	150
AS-077	NW Corner	6/4/99	36.0	1,850.0	0.1075	0.0195	1.5	58.1081	150
AS-078	SW Corner	6/4/99	36.0	2,374.4	0.1253	0.0152	1.5	52.7712	150
AS-079	SE Corner	6/4/99	33.4	2,654.5	0.0606	0.0126	1.5	22.8292	150
AS-080	NE Corner	6/8/99	3,200	2,267.1	0.2346	1.4115	1.5	103.4802	150
AS-001	SE Corner	6/8/99	88.3	2,007.6	0.1261	0.0440	1.5	62.8113	150
AS-002	SW Corner	6/8/99	43.8	2,123.8	0.1396	0.0206	1.5	65.7312	150
AS-003	NW Corner	6/8/99	24.0	1,604.7	0.1125	0.0150	1.5	70.1066	150
AS-004	NE Corner	6/15/99	2,140	2,307.3	0.2354	0.9275	1.5	102.0240	150
AS-005	NW Corner	6/15/99	59.5	2,720.8	0.0528	0.0219	1.5	19.4061	150

Table 9 (continued)

Air Sample Analytical Results
Lead and Particulate Mass
Dutch Boy, Chicago, Illinois (a)

Sample #	Location	Date	Pb Mass (µg)	Air Volume (m^3)	Particulate Mass (gm)	Pb Conc (µg/m^3)	NAAQS (b) Pb (µg/m^3)	Total Particulate Mass Conc. (c) (µg/m^3)	NAAQS PM10 (d) (µg/m^3)
AS-006	SW Corner	6/15/99	450	2,230.5	0.0716	0.2017	1.5	32.1004	150
AS-007	SE Corner	6/15/99	256	2,000.1	0.0772	0.1280	1.5	38.5981	150
AS-008	NE Corner	6/18/99	661	2,020.8	0.1582	0.3271	1.5	78.2858	150
AS-009	NW Corner	6/18/99	574	1,850.1	0.1691	0.3103	1.5	91.4005	150
AS-010	West	6/18/99	457	2,899.9	0.1524	0.1576	1.5	52.5535	150
AS-011	SE Corner	6/18/99	103	2,947.9	0.0927	0.0349	1.5	31.4461	150
AS-012	NE Corner	6/22/99	562	1,859.4	0.2131	0.3022	1.5	114.6069	150
AS-013	NW Corner*	6/22/99	2,020	1,603.6	0.3153	1.2597	1.5	**196.6201** (e)	150
AS-014	West	6/22/99	195	2,556.7	0.2665	0.0763	1.5	104.2359	150
AS-015	SE Corner	6/22/99	125	3,178.4	0.2441	0.0393	1.5	76.7989	150
AS-016	Sample not collected		-	-	-	-	-	-	-
AS-017	NE Corner	6/30/99	1,680	2,689.1	0.3425	0.6247	1.5	127.3660	150
AS-018	NW Corner	6/30/99	798	1,767.6	0.2165	0.4515	1.5	122.4825	150
AS-019	West	6/30/99	169	2,446.2	0.0870	0.0691	1.5	35.5654	150
AS-020	NE Corner*	7/10/99	3,660	2,085.1	0.1586	**1.7553**	1.5	76.0635	150
AS-021	NW Corner*	7/10/99	365	1,253.1	0.0630	0.2913	1.5	50.2753	150
AS-022	South	7/10/99	2,200	1,687.3	0.1737	1.3039	1.5	102.9455	150
AS-023	South	7/22/99	397	1,859.6	0.1913	0.2135	1.5	102.8699	150
AS-024	West	7/22/99	400	2,665.0	0.3692	0.1501	1.5	138.5366	150
AS-025	NE Corner*	7/22/99	1,060	2,099.7	0.9140	0.5048	1.5	**435.3003** (f)	150
AS-026	NE Corner*	7/30/99	5,550	1,262.8	0.3390	**4.3950**	1.5	**268.4511** (g)	150
AS-027	West	7/30/99	85.8	1,794.7	0.1267	0.0478	1.5	70.5968	150

a\ Pb = Lead; µg = micrograms; m^3 = cubic meters; gm = grams; µg/m^3 = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standard; bkgrd = background sample; * = indicates upwind sample location based on site weather station.
b\ NAAQS for lead.
c\ Typical particulate size distribution as weight percent of emissions for PM10 ranges between 10 and 55 percent of total particulate weight.
d\ NAAQS for particles of 10 microns or less (PM10).
e\ Actual PM10 mass concentration range between 19.7 and 108.2 µg/m^3 (10 to 55 percent of total particulate weight of 196.6201µg/m^3).
f\ Actual PM10 mass concentration range between 43.5 and 239.4 µg/m^3 (10 to 55 percent of total particulate weight of 435.3003 µg/m^3).
g\ Actual PM10 mass concentration range between 26.8 and 147.6 µg/m^3 (10 to 55 percent of total particulate weight of 268.4511 µg/m^3).

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Table 10

Tank Water Samples
Analytical Results for Voltile Organic Compounds
Dutch Boy Site, Chicago, Illinois (a)

Analyte	TS01	TS02	TS03	TS04	TS05	Trip Blank
VOCs (µg/l)						
Acetone	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
Bromodichloromethane	2 U	2 U	2 U	2 U	2 U	2 U
Bromoform	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	2 U	2 U	2 U	2 U	2 U	2 U
2-Butanone (MEK)	**72**	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	2 U	2 U	2 U	2 U	2 U	2 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U
Chlorodibromomethane	2 U	2 U	2 U	2 U	2 U	2 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 U
2-Chloroethyl vinyl ether	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	2 U	2 U	2 U	2 U	2 U	2 U
Chloromethane	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U
cis 1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	2 U	2 U	2 U	2 U	**5.8**	2 U
2-Hexanone	**24**	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Toluene	2 U	2 U	2 U	2 U	2 U	2 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Acetate	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Total Xylenes	2 U	2 U	2 U	2 U	**17**	2 U

a/ U = undetected; VOC = volatile organic compounds; µg/l = micrograms per liter or parts per billion

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Table 11

Tank Water Samples
Analytical Results for Polynuclear Aromatic Hydrocarbons
Dutch Boy Site, Chicago, Illinois (a)

\

Analyte PAH (µg/l)	**TS01**	**TS02**	**TS03**	**TS04**	**TS05**
Acenaphthene	4 U	4 U	4 U	4 U	4 U
Acenaphthylene	4 U	4 U	4 U	4 U	4 U
Anthracene	4 U	4 U	4 U	4 U	4 U
Benzo (a) anthracene	4 U	4 U	4 U	4 U	4 U
Benzo (a) pyrene	4 U	4 U	4 U	4 U	4 U
Benzo (b) fluoranthene	4 U	4 U	4 U	4 U	4 U
Benzo (ghi) perylene	4 U	4 U	4 U	4 U	4 U
Benzo (k) fluoranthene	4 U	4 U	4 U	4 U	4 U
Chrysene	4 U	4 U	4 U	4 U	4 U
Dibenzo (a, h) anthracene	4 U	4 U	4 U	4 U	4 U
Fluoranthene	4 U	4 U	4 U	4 U	4 U
Fluorene	4 U	4 U	4 U	4 U	4 U
Indeno (1,2,3-cd) pyrene	4 U	4 U	4 U	4 U	4 U
Naphthalene	4 U	4 U	4 U	4 U	4 U
Phenanthrene	4 U	4 U	4 U	4 U	4 U
Pyrene	4 U	4 U	4 U	4 U	4 U

a/ U = undetected; PAH = polynuclear aromatic hydrocarbons; µg/l = micrograms per liter or parts per billion

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Table 12

Tank Water Samples
Analytical Results for Metals, Cyanide, Total Suspended Solids,
Biological Oxygen Demand, pH, and Fats, Oil, and Grease
Dutch Boy Site, Chicago, Illinois (a)

Analyte	TS01	TS02	TS03	TS04	TS05
Metals (mg/l)					
Cadmium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium	**0.018**	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Hexavalent	**0.04**	0.01 U	**0.011**	0.01 U	**0.01**
Copper	**0.11**	0.05 U	0.05 U	0.05 U	0.05 U
Iron	**190**	**4.2**	**2.6**	**0.97**	**6.2**
Lead	**3.3**	**0.0079**	**0.23**	**0.018**	**0.65**
Mercury	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Nickel	**0.059**	0.05 U	0.05 U	0.05 U	0.05 U
Zinc	**1.5**	0.1 U	0.1 U	0.1 U	**0.11**
Other Parameters (mg/l)					
Cyanide	0.01 U	0.01 U	**0.013**	**0.028**	0.01 U
Total Suspended Solids	**820**	**8.5**	**33**	**2**	**87**
Biological Oxygen Demand	**3,600**	**3.9**	**33**	**27**	**42**
Fats, Oil, and Grease	**24**	5 U	5 U	5 U	5 U
pH (pH units)	**5.6**	**8.0**	**8.2**	**8.0**	**8.5**

a/ U = undetected; mg/l = milligram per liter or parts per million

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Table 13

Soil Sample CS-401 Analytical Results for
Benzene, Toluene, Xylenes, Ethylbenzene, and Polynuclear Aromatic Hydrocarbons
Dutch Boy, Chicago, Illinois (a)

Analyte VOCs (µg/kg)	CS-401	TACO Tier I Industrial-Commercial Ingestion	Analyte PAHs (µg/kg)	CS-401	TACO Tier I Industrial-Commercial Ingestion
Benzene	7.0 U	200,000	Acenaphthene	70 U	120,000,000
Toluene	7.0 U	200,000,000	Acenaphthylene	70 U	
Xylenes, Total	7.0 U	410,000,000	Anthracene	70 U	610,000,000
Ethylbenzene	7.0 U	1,000,000,000	Benzo(a)anthracene	**24**	8,000
			Benzo(a)pyrene	7.0 U	800
			Benzo(b)fluoranthene	7.0 U	8,000
			Benzo(g,h,i)perylene	7.0 U	
			Benzo(k)fluoranthene	7.0 U	78,000
			Chrysene	**66**	780,000
			Dibenz(a,h)anthracene	7.0 U	800
			Fluoranthene	**70**	82,000,000
			Fluorene	70 U	82,000,000
			Indeno(1,2,3-cd)pyrene	7.0 U	8,000
			1-Methylnaphthalene	70 U	
			2-Methylnaphthalene	70 U	
			Naphthalene	70 U	82,000,000
			Phenanthrene	70 U	
			Pyrene	**52**	61,000,000

a\ U = undetected; PAHs = polynuclear aromatic hydrocarbons; µg/kg = micrograms per kilogram
TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Soil Standards for Industrial-Commercial, Ingestion

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Table 14

Soil Sample SPU-031 Analytical Results for
Volatile Organic Compounds, and Polynuclear Aromatic Hydrocarbons, and Petroleum Hydrocarbons
Dutch Boy, Chicago, Illinois (a)

Analyte VOCs (µg/kg)	SPU-031	TACO Tier I Industrial-Commercial Ingestion
Acetone	200 U	200,000,000
Benzene	50 U	200,000
Bromoform	50 U	92,000
Bromodichloroethane	50 U	720,000
Bromomethane	100 U	2,900,000
2-Butanone (MEK)	200 U	
Carbon Disulfide	50 U	200,000,000
Carbon Tetrachloride	50 U	44,000
Chlorobenzene	50 U	41,000,000
Chloroethane	100 U	
Chloroform	50 U	940,000
Chloromethane	50 U	
Dibromochloromethane	50 U	41,000,000
1,1-Dichloroethane	50 U	200,000,000
1,2-Dichloroethane	50 U	63,000
1,1-Dichloroethene	50 U	18,000,000
1,2-Dichloroethene (total)	50 U	(c)
1,2-Dichloropropane	50 U	84,000
cis-1,3-Dichloropropene	50 U	33,000
trans-1,3-Dichloropropene	50 U	33,000
Ethylbenzene	50 U	200,000,000
2-Hexanone	200 U	
4-Methyl-2-Pentanone	200 U	
Methylene Chloride	**61** B	760,000
Styrene	50 U	410,000,000
1,1,2,2-Tetrachloroethane	50 U	
Tetrachloroethene	50 U	110,000
Toluene	50 U	410,000,000
1,1,1-Trichloroethane	50 U	
1,1,2-Trichloroethane	50 U	8,200,000
Trichloroethene	50 U	520,000
Vinyl Chloride	100 U	3,000
Xylenes, Total	50 U	1,000,000,000

Analyte PAHs (µg/kg)	SPU-031	TACO Tier I Industrial-Commercial Ingestion
Acenaphthene	3,500 U	120,000,000
Acenaphthylene	3,500 U	
Anthracene	3,500 U	610,000,000
Benzo(a)anthracene	**2,300**	8,000
Benzo(a)pyrene	**1,700**	800
Benzo(b)fluoranthene	350 U	8,000
Benzo(g,h,i)perylene	**1,100**	
Benzo(k)fluoranthene	350 U	78,000
Chrysene	**720**	780,000
Dibenz(a,h)anthracene	350 U	800
Fluoranthene	350 U	82,000,000
Fluorene	**5,800**	82,000,000
Indeno(1,2,3-cd)pyrene	**1,100**	8,000
1-Methylnaphthalene	**26,000**	
2-Methylnaphthalene	**21,000**	
Naphthalene	3,500 U	82,000,000
Phenanthrene	**19,000**	
Pyrene	**3,800**	61,000,000

Analyte Petroleum Hydrocarbons (mg/kg)	SPU-031
Extractable- DRO	**4,100**
Volatile - GRO	**65**

a\ U = undetected; B = Blank Contamination; VOCs = Volatile Organic Compounds; PAHs = polynuclear aromatic hydrocarbons;
µg/kg = micrograms per kilogram; mg/kg = micrograms per kilogram; DRO = Diesel Range Organics; GRO = Gasoline Range Orangics,
TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Soil Standards for Industrial-Commercial, Ingestion

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Table 15

Excavation Confirmation Soil Sample Analytical Results for
Volatile Organic Chemicals
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22,1999 (a)

Analyte	UST-001	UST-002	UST-003	UST-004	UST-204(b)	TACO Tier I Industrial-Comm Ingestion
VOCs (µg/kg)						
Acetone	**29 J**	25 U	27 U	24 U	32 U	200,000,000
Benzene	6.0 U	**6.7**	6.7 U	6.0 U	7.9 U	200,000
Bromodichloromethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	92,000
Bromoform	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	720,000
Bromomethane	12 U	12 U	13 U	12 U	16 U	2,900,000
2-Butanone (MEK)	24 U	25 U	27 U	24 U	32 U	
Carbon Disulfide	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	200,000,000
Carbon Tetrachloride	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	44,000
Chlorobenzene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	41,000,000
Chloroethane	12 U	12 U	13 U	12 U	16 U	
Chloroform	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	940,000
Chloromethane	12 U	12 U	13 U	12 U	16 U	
Dibromochloromethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	41,000,000
1,1-Dichloroethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	200,000,000
1,2-Dichloroethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	63,000
1,1-Dichloroethene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	18,000,000
1,2-Dichloroethene (total)	6.0 U	**8.5**	6.7 U	6.0 U	7.9 U	(c)
1,2-Dichloropropane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	84,000
cis-1,3-Dichloropropene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	33,000
trans-1,3-Dichloropropene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	33,000
Ethylbenzene	**6.9**	**6.7**	**98**	6.0 U	7.9 U	200,000,000
2-Hexanone	24 U	25 U	27 U	24 U	32 U	
4-Methyl-2-Pentanone	24 U	25 U	27 U	24 U	32 U	
Methylene Chloride	**8.8 JB**	**7.7 JB**	**7.1 JB**	**8.4 JB**	**9.3 JB**	760,000
Styrene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	410,000,000
1,1,2,2-Tetrachloroethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	
Tetrachloroethene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	110,000
Toluene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	410,000,000
1,1,1-Trichloroethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	
1,1,2-Trichloroethane	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	8,200,000
Trichloroethene	6.0 U	6.2 U	6.7 U	6.0 U	7.9 U	520,000
Vinyl Chloride	12 U	12 U	13 U	12 U	16 U	3,000
Xylene (total)	**34**	**32**	**290**	6.0 U	**20**	1,000,000,000

Table 15

Excavation Confirmation Soil Sample Analytical Results for
Volatile Organic Chemicals
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22,1999 (a)

Analyte VOCs (µg/kg)	UST-006	UST-007	UST-008	UST-009	TACO Tier I Industrial-Comm Ingestion
Acetone	24 U	24 U	23 U	23 U	200,000,000
Benzene	5.9 U	5.9 U	5.8 U	5.8 U	200,000
Bromodichloromethane	5.9 U	5.9 U	5.8 U	5.8 U	92,000
Bromoform	5.9 U	5.9 U	5.8 U	5.8 U	720,000
Bromomethane	12 U	12 U	12 U	12 U	2,900,000
2-Butanone (MEK)	24 U	24 U	23 U	23 U	
Carbon Disulfide	5.9 U	5.9 U	5.8 U	5.8 U	200,000,000
Carbon Tetrachloride	5.9 U	5.9 U	5.8 U	5.8 U	44,000
Chlorobenzene	5.9 U	5.9 U	5.8 U	5.8 U	41,000,000
Chloroethane	12 U	12 U	12 U	12 U	
Chloroform	5.9 U	5.9 U	5.8 U	5.8 U	940,000
Chloromethane	12 U	12 U	12 U	12 U	
Dibromochloromethane	5.9 U	5.9 U	5.8 U	5.8 U	41,000,000
1,1-Dichloroethane	5.9 U	5.9 U	5.8 U	5.8 U	200,000,000
1,2-Dichloroethane	5.9 U	5.9 U	5.8 U	5.8 U	63,000
1,1-Dichloroethene	5.9 U	5.9 U	5.8 U	5.8 U	18,000,000
1,2-Dichloroethene (total)	5.9 U	5.9 U	5.8 U	5.8 U	20,000,000(c)
1,2-Dichloropropane	5.9 U	5.9 U	5.8 U	5.8 U	84,000
cis-1,3-Dichloropropene	5.9 U	5.9 U	5.8 U	5.8 U	33,000
trans-1,3-Dichloropropene	5.9 U	5.9 U	5.8 U	5.8 U	33,000
Ethylbenzene	5.9 U	5.9 U	5.8 U	5.8 U	200,000,000
2-Hexanone	24 U	24 U	23 U	23 U	
4-Methyl-2-Pentanone	24 U	24 U	23 U	23 U	
Methylene Chloride	5.9 U	**6.9 B**	5.8 U	5.8 U	760,000
Styrene	5.9 U	5.9 U	5.8 U	5.8 U	410,000,000
1,1,2,2-Tetrachloroethane	5.9 U	5.9 U	5.8 U	5.8 U	
Tetrachloroethene	5.9 U	5.9 U	5.8 U	5.8 U	110,000
Toluene	5.9 U	5.9 U	5.8 U	5.8 U	410,000,000
1,1,1-Trichloroethane	5.9 U	5.9 U	5.8 U	5.8 U	
1,1,2-Trichloroethane	5.9 U	5.9 U	5.8 U	5.8 U	8,200,000
Trichloroethene	5.9 U	5.9 U	5.8 U	5.8 U	520,000
Vinyl Chloride	12 U	12 U	12 U	12 U	3,000
Xylene (total)	5.9 U	5.9 U	5.8 U	5.8 U	1,000,000,000

a\ U = undetected; J = estimated value; B = probable blank contamination; µg/kg = micrograms per kilogram; TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Industrial-Commercial, Ingestion
b\ Duplicate of UST-004
c\ Tier I value for cis-1,2-Dichloroethene is 20,000,000, Tier I value for trans-1,2-Dichloroethene is 41,000,000

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Table 16

Excavation Confirmation Soil Sample Analytical Results for
Semivolatile Organic Compounds
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22, 1999 (a)

Analyte	UST-001	UST-002	UST-003	UST-004	UST-204 (b)	TACO Tier I Industrial-Comm Ingestion
SVOCs (µg/kg)						
Acenaphthene	400 U	410 U	440 U	400 U	400 U	120,000,000
Acenaphthylene	400 U	410 U	440 U	400 U	400 U	
Anthracene	400 U	410 U	440 U	400 U	400 U	610,000,000
Benzo(a)anthracene	400 U	410 U	440 U	400 U	**770**	8,000
Benzo(a)pyrene	400 U	410 U	440 U	400 U	**630**	800
Benzo(b)fluoranthene	400 U	410 U	440 U	400 U	**440**	8,000
Benzo(g,h,i)perylene	400 U	410 U	440 U	400 U	400 U	
Benzo(k)fluoranthene	400 U	410 U	440 U	400 U	**500**	78,000
Bis(2-chloroethoxy)methane	400 U	410 U	440 U	400 U	400 U	
Bis(2-chloroethyl)ether	400 U	410 U	440 U	400 U	400 U	5,000
Bis(2-ethylhexyl)phthalate	400 U	410 U	440 U	400 U	400 U	410,000
4-Bromophenyl phenyl ether	400 U	410 U	440 U	400 U	400 U	
Butyl benzyl phthalate	400 U	410 U	440 U	400 U	400 U	410,000,000
Carbazone	400 U	410 U	440 U	400 U	400 U	290,000
4-Chloro-3-methylphenol	400 U	410 U	440 U	400 U	400 U	
4-Chloroaniline	400 U	410 U	440 U	400 U	400 U	8,200,000
2-Chloronaphthalene	400 U	410 U	440 U	400 U	400 U	
2-Chlorophenol	400 U	410 U	440 U	400 U	400 U	
4-Chlorophenyl phenyl ether	400 U	410 U	440 U	400 U	400 U	
2,2'-oxybis (1-Chloropropane)	400 U	410 U	440 U	400 U	400 U	
Chrysene	400 U	410 U	440 U	400 U	**730**	780,000
Dibenz(a,h)anthracene	400 U	410 U	440 U	400 U	400 U	800
Di-n-butylphthalate	400 U	410 U	440 U	400 U	400 U	200,000,000
Di-n-octylphthalate	400 U	410 U	440 U	400 U	400 U	
Dibenzofuran	400 U	410 U	440 U	400 U	400 U	
1,2-Dichlorobenzene	400 U	410 U	440 U	400 U	400 U	180,000,000
1,3-Dichlorobenzene	400 U	410 U	440 U	400 U	400 U	
1,4-Dichlorobenzene	400 U	410 U	440 U	400 U	400 U	
3,3-Dichlorobenzidine	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	13,000
2,4-Dichlorophenol	400 U	410 U	440 U	400 U	400 U	
Diethylphthalate	400 U	410 U	440 U	400 U	400 U	1,000,000,000
Dimethylphthalate	400 U	410 U	440 U	400 U	400 U	
2,4-Dimethylphenol	400 U	410 U	440 U	400 U	400 U	41,000,000
4,6-Dinitro-2-methylphenol	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
2,4-Dinitrophenol	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
2,4-Dinitrotoluene	400 U	410 U	440 U	400 U	400 U	8,400
2,6-Dinitrotoluene	400 U	410 U	440 U	400 U	400 U	8,400
Fluoranthene	400 U	410 U	440 U	400 U	**1,500**	82,000,000
Fluorene	400 U	410 U	440 U	400 U	400 U	82,000,000
Hexachlorobenzene	400 U	410 U	440 U	400 U	400 U	4,000
Hexachlorobutadiene	400 U	410 U	440 U	400 U	400 U	

Table 16 (continued)

Excavation Confirmation Soil Sample Analytical Results for
Semivolatile Organic Compounds
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22, 1999 (a)

Analyte	UST-001	UST-002	UST-003	UST-004	UST-204 (b)	TACO Tier I Industrial-Comm Ingestion
SVOCs (µg/kg)						
Hexachlorocyclopentadiene	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	14,000,000
Hexachloroethane	400 U	410 U	440 U	400 U	400 U	2,000,000
Indeno(1,2,3-cd)pyrene	400 U	410 U	440 U	400 U	400 U	8,000
Isophorone	400 U	410 U	440 U	400 U	400 U	410,000,000
2-Methylnaphthalene	**3,100**	**9,900 E**	**2,200**	**1,900**	400 U	
2-Methylphenol	400 U	410 U	440 U	400 U	400 U	100,000,000
4-Methylphenol	400 U	410 U	440 U	400 U	400 U	
Naphthalene	400 U	410 U	**2,300**	**1,000**	400 U	82,000,000
2-Nitroaniline	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
3-Nitroaniline	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
4-Nitroaniline	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
Nitrobenzene	400 U	410 U	440 U	400 U	400 U	1,000,000
2-Nitrophenol	400 U	410 U	440 U	400 U	400 U	
4-Nitrophenol	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
n-Nitrosodi-n-propylamine	400 U	410 U	440 U	400 U	400 U	800
n-Nitrosodiphenylamine	400 U	410 U	440 U	400 U	400 U	1,200,000
Pentachlorophenol	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	
Phenanthrene	**780**	**540**	440 U	400 U	**960**	
Phenol	400 U	410 U	440 U	400 U	400 U	1,000,000,000
Pyrene	400 U	410 U	440 U	400 U	**1,400**	61,000,000
1,2,4-Trichlorobenzene	400 U	410 U	440 U	400 U	400 U	20,000,000
2,4,5-Trichlorophenol	400 U	410 U	440 U	400 U	400 U	
2,4,6-Trichlorophenol	400 U	410 U	440 U	400 U	400 U	

Table 16 (continued)

Excavation Confirmation Soil Sample Analytical Results for
Semivolatile Organic Compounds
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22, 1999 (a)

Analyte	UST-006	UST-007	UST-008	UST-009	TACO Tier I Industrial-Comm Ingestion
SVOCs (μg/kg)					
Acenaphthene	390 U	390 U	390 U	380 U	120,000,000
Acenaphthylene	390 U	390 U	390 U	380 U	
Anthracene	390 U	390 U	390 U	380 U	610,000,000
Benzo(a)anthracene	390 U	390 U	390 U	380 U	8,000
Benzo(a)pyrene	390 U	390 U	390 U	380 U	800
Benzo(b)fluoranthene	390 U	390 U	390 U	380 U	8,000
Benzo(g,h,i)perylene	390 U	390 U	390 U	380 U	
Benzo(k)fluoranthene	390 U	390 U	390 U	380 U	78,000
Bis(2-chloroethoxy)methane	390 U	390 U	390 U	380 U	
Bis(2-chloroethyl)ether	390 U	390 U	390 U	380 U	5,000
Bis(2-ethylhexyl)phthalate	390 U	390 U	390 U	380 U	410,000
4-Bromophenyl phenyl ether	390 U	390 U	390 U	380 U	
Butyl benzyl phthalate	390 U	390 U	390 U	380 U	410,000,000
Carbazone	390 U	390 U	390 U	380 U	290,000
4-Chloro-3-methylphenol	390 U	390 U	390 U	380 U	
4-Chloroaniline	390 U	390 U	390 U	380 U	8,200,000
2-Chloronaphthalene	390 U	390 U	390 U	380 U	
2-Chlorophenol	390 U	390 U	390 U	380 U	
4-Chlorophenyl phenyl ether	390 U	390 U	390 U	380 U	
2,2'-oxybis (1-Chloropropane)	390 U	390 U	390 U	380 U	
Chrysene	390 U	390 U	390 U	380 U	780,000
Dibenz(a,h)anthracene	390 U	390 U	390 U	380 U	800
Di-n-butylphthalate	390 U	390 U	390 U	380 U	200,000,000
Di-n-octylphthalate	390 U	390 U	390 U	380 U	
Dibenzofuran	390 U	390 U	390 U	380 U	
1,2-Dichlorobenzene	390 U	390 U	390 U	380 U	180,000,000
1,3-Dichlorobenzene	390 U	390 U	390 U	380 U	
1,4-Dichlorobenzene	390 U	390 U	390 U	380 U	
3,3-Dichlorobenzidine	1,900 U	1,900 U	1,900 U	1,900 U	13,000
2,4-Dichlorophenol	390 U	390 U	390 U	380 U	
Diethylphthalate	390 U	390 U	390 U	380 U	1,000,000,000
Dimethylphthalate	390 U	390 U	390 U	380 U	
2,4-Dimethylphenol	390 U	390 U	390 U	380 U	41,000,000
4,6-Dinitro-2-methylphenol	1,900 U	1,900 U	1,900 U	1,900 U	
2,4-Dinitrophenol	1,900 U	1,900 U	1,900 U	1,900 U	
2,4-Dinitrotoluene	390 U	390 U	390 U	380 U	8,400
2,6-Dinitrotoluene	390 U	390 U	390 U	380 U	8,400
Fluoranthene	390 U	390 U	390 U	380 U	82,000,000
Fluorene	390 U	390 U	390 U	380 U	82,000,000
Hexachlorobenzene	390 U	390 U	390 U	380 U	4,000
Hexachlorobutadiene	390 U	390 U	390 U	380 U	

Table 16 (continued)

Excavation Confirmation Soil Sample Analytical Results for
Semivolatile Organic Compounds
Former Underground Storage Tank Area - Tanks T-1, T-2, T-3, T-4, T-5, and T-6
Dutch Boy Site - Chicago, Illinois
July 19 - 22, 1999 (a)

Analyte	UST-006	UST-007	UST-008	UST-009	TACO Tier I Industrial-Comm Ingestion
SVOCs (µg/kg)					
Hexachlorocyclopentadiene	1,900 U	1,900 U	1,900 U	1,900 U	14,000,000
Hexachloroethane	390 U	390 U	390 U	380 U	2,000,000
Indeno(1,2,3-cd)pyrene	390 U	390 U	390 U	380 U	8,000
Isophorone	390 U	390 U	390 U	380 U	410,000,000
2-Methylnaphthalene	390 U	390 U	390 U	380 U	
2-Methylphenol	390 U	390 U	390 U	380 U	100,000,000
4-Methylphenol	390 U	390 U	390 U	380 U	
Naphthalene	390 U	390 U	390 U	380 U	82,000,000
2-Nitroaniline	1,900 U	1,900 U	1,900 U	1,900 U	
3-Nitroaniline	1,900 U	1,900 U	1,900 U	1,900 U	
4-Nitroaniline	1,900 U	1,900 U	1,900 U	1,900 U	
Nitrobenzene	390 U	390 U	390 U	380 U	1,000,000
2-Nitrophenol	390 U	390 U	390 U	380 U	
4-Nitrophenol	1,900 U	1,900 U	1,900 U	1,900 U	
n-Nitrosodi-n-propylamine	390 U	390 U	390 U	380 U	800
n-Nitrosodiphenylamine	390 U	390 U	390 U	380 U	1,200,000
Pentachlorophenol	1,900 U	1,900 U	1,900 U	1,900 U	
Phenanthrene	390 U	390 U	390 U	380 U	
Phenol	390 U	390 U	390 U	380 U	1,000,000,000
Pyrene	390 U	390 U	390 U	380 U	61,000,000
1,2,4-Trichlorobenzene	390 U	390 U	390 U	380 U	20,000,000
2,4,5-Trichlorophenol	390 U	390 U	390 U	380 U	
2,4,6-Trichlorophenol	390 U	390 U	390 U	380 U	
2,4,6-Trichlorophenol	390 U	390 U	390 U	380 U	30,650

a\ U = undetected; E = probable blank contamination; µg/kg = micrograms per kilogram; SVOC = semivolatile organic compounds; TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Industrial-Commercial, Ingestion
b\ Duplicate of UST-004

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Table 17

Excavation Confirmation Soil Sample Analytical Results for
Benzene, Toluene, Xylenes, Ethylbenzene, and Polynuclear Aromatic Hydrocarbons
Former Underground Storage Tank Area - Tanks T-7, T-8, and T-9
Dutch Boy, Chicago, Illinois (a)
August 4, 1999

Analyte	UST-010	UST-011	UST-012	UST-013	UST-014	UST-015	UST-215 (b)	UST-016	UST-017	TACO Tier I Industrial-Commercial Ingestion
VOCs (μg/kg)										
Benzene	6.5 U	6.7 U	5.2 U	6.1 U	6.0 U	6.5 U	6.3 U	6.2 U	5.2 U	200,000
Toluene	6.5 U	6.7 U	5.2 U	6.1 U	6.0 U	6.5 U	6.3 U	6.2 U	5.2 U	200,000,000
Xylenes, Total	6.5 U	6.7 U	5.2 U	6.1 U	6.0 U	6.5 U	6.3 U	6.2 U	5.2 U	410,000,000
Ethylbenzene	6.5 U	6.7 U	5.2 U	6.1 U	6.0 U	6.5 U	6.3 U	6.2 U	5.2 U	1,000,000,000
PAHs (μg/kg)										
Acenaphthene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	62 U	520 U	120,000,000
Acenaphthylene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	62 U	520 U	
Anthracene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	62 U	520 U	610,000,000
Benzo(a)anthracene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	**91**	8,000
Benzo(a)pyrene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	800
Benzo(b)fluoranthene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	8,000
Benzo(g,h,i)perylene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	
Benzo(k)fluoranthene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	78,000
Chrysene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	**200**	780,000
Dibenz(a,h)anthracene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	800
Fluoranthene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	**630**	82,000,000
Fluorene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	62 U	520 U	82,000,000
Indeno(1,2,3-cd)pyrene	6.5 U	6.7 U	26 U	31 U	6.0 U	6.5 U	6.3 U	6.2 U	52 U	8,000
1-Methylnaphthalene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	62 U	**850**	
2-Methylnaphthalene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	**66**	**1,100**	
Naphthalene	65 U	67 U	260 U	310 U	60 U	65 U	63 U	**180**	520 U	82,000,000
Phenanthrene	65 U	67 U	260 U	310 U	60 U	65 U	62 U	62 U	**760**	
Pyrene	6.5 U	**16.0**	26 U	**530**	6.0 U	6.5 U	**8.6**	**11**	**350**	61,000,000

a\ U = undetected; PAHs = polynuclear aromatic hydrocarbons; μg/kg = micrograms per kilogram
TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Soil Standards for Industrial-Commercial, Ingestion
b\ Duplicate of UST-015

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Table 18

**Excavation Confirmation Soil Sample Analytical Results for
Benzene, Toluene, Xylenes, Ethylbenzene, and Polynuclear Aromatic Hydrocarbons
Former Underground Storage Tank Area - Piping Area
Dutch Boy, Chicago, Illinois (a)
August 6, 1999**

Analyte **VOCs (mg/kg)**	**UST-005**	**TACO Tier I Industrial-Commercial Ingestion**
Benzene	5.9 U	200,000
Toluene	5.9 U	200,000,000
Xylenes, Total	**590 J**	410,000,000
Ethylbenzene	**200 J**	1,000,000,000
PAHs (μg/kg)		
Acenaphthene	590 U	120,000,000
Acenaphthylene	590 U	
Anthracene	590 U	610,000,000
Benzo(a)anthracene	**350 J**	8,000
Benzo(a)pyrene	**400 J**	800
Benzo(b)fluoranthene	**370 J**	8,000
Benzo(g,h,i)perylene	**240 J**	
Benzo(k)fluoranthene	**220 J**	78,000
Chrysene	**380 J**	780,000
Dibenz(a,h)anthracene	59 U	800
Fluoranthene	**1,700 J**	82,000,000
Fluorene	590 U	82,000,000
Indeno(1,2,3-cd)pyrene	**270 J**	8,000
1-Methylnaphthalene	**1,600 J**	
2-Methylnaphthalene	**5,900 J**	
Naphthalene	**3,300 J**	82,000,000
Phenanthrene	**1,600 J**	
Pyrene	**1,100 J**	61,000,000

a\ U = undetected; J = estimated value; PAHs = polynuclear aromatic hydrocarbons; μg/kg = micrograms per kilogram;TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Soil Standards for Industrial-Commercial, Ingestion

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Table 19

Flowable Fill/Soil Sample Analytical Results for
VOCs, Polynuclear Aromatic Hydrocarbons, and Total Lead
Dutch Boy, Chicago, Illinois (a)

Analyte VOCs (μg/kg)	Flowable Fill/Soil	TACO Tier I Industrial-Commercial Ingestion (b)
Acetone	23.0 U	200,000,000
Benzene	5.8 U	200,000
Bromodichloromethane	5.8 U	92,000
Bromoform	5.8 U	720,000
Bromomethane	12.0 U	2,900,000
2-Butanone (MEK)	23.0 U	
Carbon Disulfide	5.8 U	200,000,000
Carbon Tetrachloride	5.8 U	44,000
Chlorobenzene	5.8 U	41,000,000
Chloroethane	12.0 U	
Chloroform	5.8 U	940,000
Chloromethane	12.0 U	
Dibromochloromethane	5.8 U	41,000,000
1,1-Dichloroethane	5.8 U	200,000,000
1,2-Dichloroethane	5.8 U	63,000
1,1-Dichloroethene	5.8 U	18,000,000
1,2-Dichloroethene (total)	5.8 U	20,000,000 (c)
1,2-Dichloropropane	5.8 U	84,000
cis-1,3-Dichloropropene	5.8 U	33,000
trans-1,3-Dichloropropene	5.8 U	33,000
Ethylbenzene	5.8 U	200,000,000
2-Hexanone	23.0 U	
4-Methyl-2-Pentanone	23.0 U	
Methylene Chloride	5.8 U	760,000
Styrene	5.8 U	410,000,000
1,1,2,2-Tetrachloroethane	5.8 U	
Tetrachloroethene	5.8 U	110,000
Toluene	5.8 U	410,000,000
1,1,1-Trichloroethane	5.8 U	
1,1,2-Trichloroethane	5.8 U	8,200,000
Trichloroethene	5.8 U	520,000
Vinyl Chloride	12.0 U	3,000
Xylene (total)	5.8 U	1,000,000,000

Analyte PAHs (μg/kg)	Flowable Fill/Soil	TACO Tier I Industrial-Commercial Ingestion (b)
Acenaphthene	580 U	120,000,000
Acenaphthylene	580 U	
Anthracene	580 U	610,000,000
Benzo(a)anthracene	**400**	8,000
Benzo(a)pyrene	**560**	800
Benzo(b)fluoranthene	**200**	8,000
Benzo(g,h,i)perylene	58.0 U	
Benzo(k)fluoranthene	58.0 U	78,000
Chrysene	**360**	780,000
Dibenz(a,h)anthracene	58.0 U	800
Fluoranthene	**850**	82,000,000
Fluorene	580 U	82,000,000
Indeno(1,2,3-cd)pyrene	58.0 U	8,000
1-Methylnaphthalene	580 U	
2-Methylnaphthalene	580 U	
Naphthalene	580 U	82,000,000
Phenanthrene	**720**	
Pyrene	**560**	61,000,000

Analyte	Flowable Fill/Soil
Total Lead (mg/kg)	6,340

a\ U = undetected; VOCs = Volatile Organic Compounds; μg/kg = micrograms per kilogram, mg/kg = milligram per kilogram;
b\TACO Tier I = Illinois Tiered Approach to Corrective Action Objectives, Soil Standards for Industrial-Commercial, Ingestion
c\ Tier I value for cis-1,2-Dichloroethene is 20,000,000, Tier I value for trans-1,2-Dichloroethene is 41,000,000

Table 20

**Flowable Fill Sample Analytical Results for
Total and TCLP Lead,
Flash Point, Paint Filter, and pH
Dutch Boy, Chicago, Illinois (a)**

Analyte/Sample (b)		Analyte/Sample (b)	
Total Lead (mg/kg)		TCLP Lead (mg/l)	
Flowable Fill #1	340	Flowable Fill #1	O.5 U
Flowable Fill #2	356	Flowable Fill #2	O.5 U
Flowable Fill #3	486	Flowable Fill #3	O.5 U
Analyte/Sample (c)		**Analyte/Sample (c)**	
Flash Point, Open Cup		TCLP Lead (mg/l)	
Flowable-1	>200 ° F	Flowable-1	0.011
Paint Filter			
Flowable-1	Pass		
pH			
Flowable-1	11		

a\ U = undetected; mg/kg = milligram per kilogram; mg/l = milligram per liter;
TCLP = Toxicity Characteristic Leaching Procedure
b\ Analyses performed by Quanterra, Inc.
c\ Analysis performed by Great Lakes Environmental.

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Table 21

Debris Stockpile Samples
Toxicity Characteristic Leaching Procedure Lead Analytical Results
Dutch Boy Site, Chicago, Illinois (a)

Analyte (mg/l)	DP-001 (b)	SWDP-1 (c)
TCLP Lead	13.3	0.5 U

a/ U = undetected; mg/l = milligrams per liter
b/ composite sample of soil and debris from bottom of large stockpile
c/ composite sample of treated soil and debris from bottom of large stockpile.

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Table 22

Backfill Soil Sample Analytical Results for
Volatile Organic Compounds, Semivolatile Organic Compounds,
Organopesticides, PCBs, Metals, and Total Cyanide
Dutch Boy, Chicago, Illinois (a)

Analyte VOCs (µg/kg)	Borrow-01A (b)	Analyte SVOCs (µg/kg)	Borrow-01	Analyte SVOCs (µg/kg)	Borrow-01
Acetone	20 U	Acenaphthene	390 U	4,6-Dinitro-2-methylphenol	1,900 U
Benzene	5.0 U	Acenaphthylene	390 U	2,4-Dinitrophenol	1,900 U
Bromoform	5.0 U	Anthracene	390 U	2,4-Dinitrotoluene	390 U
Bromodichloroethane	5.0 U	Benzo(a)anthracene	390 U	2,6-Dinitrotoluene	390 U
Bromomethane	10 U	Benzo(a)pyrene	390 U	Fluoranthene	390 U
2-Butanone (MEK)	20 U	Benzo(b)fluoranthene	390 U	Fluorene	390 U
Carbon Disulfide	5.0 U	Benzo(g,h,i)perylene	390 U	Hexachlorobenzene	390 U
Carbon Tetrachloride	5.0 U	Benzo(k)fluoranthene	390 U	Hexachlorobutadiene	390 U
Chlorobenzene	5.0 U	Benzyl butyl phthalate	390 U	Hexachlorocyclopentadiene	1,900 U
Chloroethane	10 U	Bis(2-chloroethoxy)methane	390 U	Hexachloroethane	390 U
Chloroform	5.0 U	Bis(2-chloroethyl)ether	390 U	Indeno(1,2,3-cd)pyrene	390 U
Chloromethane	10 U	Bis(2-ethylhexyl)phthalate	390 U	Isophorone	390 U
Dibromochloromethane	5.0 U	4-Bromophenyl phenyl ether	390 U	2-Methylnaphthalene	390 U
1,1-Dichloroethane	5.0 U	Carbazole	390 U	2-Methylphenol	390 U
1,2-Dichloroethane	5.0 U	4-Chloro-3-methylphenol	390 U	4-Methylphenol	390 U
1,1-Dichloroethene	5.0 U	4-Chloroaniline	390 U	Naphthalene	390 U
1,2-Dichloroethene (total)	5.0 U	2-Chloronaphthalene	390 U	2-Nitroaniline	1,900 U
1,2-Dichloropropane	5.0 U	2-Chlorophenol	390 U	3-Nitroaniline	1,900 U
cis-1,3-Dichloropropene	5.0 U	4-Chlorophenyl phenyl ether	390 U	4-Nitroaniline	1,900 U
trans-1,3-Dichloropropene	5.0 U	Chrysene	390 U	Nitrobenzene	390 U
Ethylbenzene	5.0 U	Dibenz(a,h)anthracene	390 U	2-Nitrophenol	390 U
2-Hexanone	20 U	Di-n-butylphthalate	390 U	4-Nitrophenol	1,900 U
4-Methyl-2-Pentanone	20 U	Di-n-octylphthalate	390 U	n-Nitrosodi-n-propylamine	390 U
Methylene Chloride	5.0 U	Dibenzofuran	390 U	n-Nitrosodimethylamine	390 U
Styrene	5.0 U	1,2-Dichlorobenzene	390 U	n-Nitrosodiphenylamine	390 U
1,1,2,2-Tetrachloroethane	5.0 U	1,3-Dichlorobenzene	390 U	2,2-Oxybis(1-chloropropane)	390 U
Tetrachloroethene	5.0 U	1,4-Dichlorobenzene	390 U	Pentachlorophenol	1,900 U
Toluene	5.0 U	3,3-Dichlorobenzidine	1,900 U	Phenanthrene	390 U
1,1,1-Trichloroethane	5.0 U	2,4-Dichlorophenol	390 U	Phenol	390 U
1,1,2-Trichloroethane	5.0 U	Diethylphthalate	390 U	Pyrene	390 U
Trichloroethene	5.0 U	Dimethylphthalate	390 U	1,2,4-Trichlorobenzene	390 U
Vinyl Chloride	10 U	2,4-Dichlorophenol	390 U	2,4,5-Trichlorophenol	390 U
Xylenes, Total	5.0 U	2,4-Dimethylphenol	390 U	2,4,6-Trichlorophenol	390 U

Table 22 (continued)

Backfill Soil Sample Analytical Results for
Volatile Organic Compounds, Semivolatile Organic Compounds,
Organopesticides, PCBs, Metals, and Total Cyanide
Dutch Boy, Chicago, Illinois
May 1999 (a)

Analyte Organopesticides (µg/kg)	Borrow-01
Aldrin	2.0 U
alpha-BHC	2.0 U
beta-BHC	2.0 U
delta-BHC	2.0 U
gamma-BHC (Lindane)	2.0 U
Chlordane (technical)	20 U
4,4'-DDD	2.0 U
4,4'-DDE	2.0 U
4,4'-DDT	2.0 U
Dieldrin	**25**
Endrin	2.0 U
Endrin aldehyde	2.0 U
Endosulfan I	2.0 U
Endosulfan II	2.0 U
Endosulfan sulfate	2.0 U
Heptachlor	2.0 U
Heptachlor Epoxide	2.0 U
Methoxychlor	3.9 U
Toxaphene	79 U

Analyte PCBs (µg/kg)	Borrow-01
Arochlor 1016	39 U
Arochlor 1221	39 U
Arochlor 1232	39 U
Arochlor 1242	39 U
Arochlor 1248	39 U
Arochlor 1254	39 U
Arochlor 1260	39 U

Analyte Metals (mg/kg)	Borrow-01	
Aluminum	13,800	
Antimony	ND	(7.1)
Arsenic	8.1	
Barium	86.2	
Beryllium	0.80	
Cadmium	ND	(0.59)
Calcium	2,090	
Chromium	19.5	
Cobalt	12.6	
Copper	17.2	
Iron	22,800	
Lead	22.8	
Magnesium	3,230	
Manganese	715	
Mercury	ND	(0.039)
Nickel	20.8	
Potassium	1,650	
Selenium	0.60	
Silver	ND	(1.2)
Sodium	ND	(593)
Thallium	ND	(1.2)
Vanadium	27.3	
Zinc	61.2	

Petroleum Hydrocarbons (mg/kg)	Borrow-01	
DRO - Extractables	ND	(12)
GRO - Volatiles	ND	(0.12)

Inorganic (mg/kg)	Borrow-01	
Total Cyanide	ND	(0.59)

a/ U = undetected; VOC = volatile organic compounds; SVOC = semivolatile organic compounds; ND (12) = Not Detected at or above the reporting limit shown in parentheses; PCBs = polychlorinated biphenyls; µg/kg = micrograms per kilogram; mg/kg = milligrams per kilogram; DRO = Diesel Range Organics; GRO = Gasoline range Organics.
b/ Borrow-01A was collected from same location as Borrow -01.

G:\clients\dutchboy\tables\tab22.xls

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

March 27, 2000

REPLY TO THE ATTENTION OF

Barbara Wong
Senior Technical Manager
Environmental Strategies Corporation
11911 Freedom Drive
Reston, Virginia 20190

Dear Ms. Wong:

The U.S. Environmental Protection Agency (EPA) hereby approves the December 22, 1999 "Remedial Action Report- Dutch Boy Site- Chicago, Illinois". EPA would also like to thank everyone involved in the project from ESC and RSI for a job well done. Even with a greatly increased scope, work was still completed in a timely fashion. Additionally, dust control efforts on the project were excellent, especially given the high temperatures and drought conditions in the Chicago area during the summer of 1999.

Please contact me at (312) 886-4742 if you have any questions concerning this letter.

Sincerely,

Brad Bradley

Brad Bradley
On-Scene Coordinator

cc: Kirk Riley, TOSC
VH/MP Advisory Council c/o Tony Davenport